

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE: FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

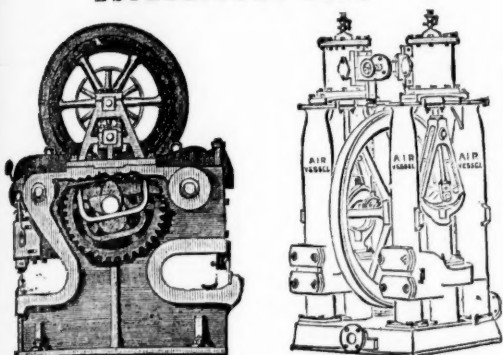
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No. 2188.—VOL. XLVII.

LONDON, SATURDAY, JULY 28, 1877.

PRICE (WITH THE JOURNAL) SIXPENCE.
PER ANNUM, BY POST, £1 4s.

JOHN CAMERON'S
SPECIALITIES ARE ALL SIZES OF
**Steam Pumps, Shipbuilders' Tools,
BAR SHEARS.**
ESTABLISHED 1852.



**OLDFIELD ROAD IRON WORKS,
SALFORD, MANCHESTER.**

For Excellence
and Practical Success
of Engines



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Model exhibited by
this Firm.

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LONDON OFFICE,—186, GRESHAM HOUSE, E.C.

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PUMPING and other LAND ENGINES and MARINE STEAM ENGINES
of the largest and most approved kinds in use, SUGAR MACHINERY,
MILLWORK, MINING MACHINERY, AND MACHINERY IN GE-
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In Good Condition, at Moderate Prices—viz.,

PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES;
STEAM CAPSTANS; ORE CRUSHERS; BOILERS and PITWORK of
various sizes and descriptions; and all kinds of MATERIALS required for
MINING PURPOSES.

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IRONFOUNDERS, ENGINEERS, &c.,
Haydon Bridge, near NEWCASTLE-ON-TYNE,

Manufacturers of
LEAD SMELTING, REDUCING, AND REFINING FURNACES,
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Plans and Estimates furnished for Improved Lead or Copper Mining and
Smelting Plant.

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THOMAS AND WILLIAM SMITH,
Manufacturers of all kinds of Iron, Steel, Copper, and Galvanised Wire Ropes;
Hemp and Manila Ropes, &c.; Round and Flat Shaft Ropes; Crab Ropes; Guide
Ropes; Hoisting Ropes; and Galvanised Signal Strand; Ship's Standing Rigging
Steel complete; Patent Hemp and Manila Hawseers, Warps, Cordage, Spun-yarn,
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Rods; Steel Plough Ropes; Fencing Wire and Stand Lightning Conductors, &c.
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**STANDARD LUBRICATING OILS
COMPANY, LIMITED.**

DARK and PALE OILS for MACHINERY, RAILWAY, and MINING
PURPOSES, from TWO SHILLINGS per gallon, and upwards.
AGENTS WANTED.
95, CANNON STREET, LONDON, E.C.

ALEX. CHAPLIN AND CO.,
CRANSTONHILL ENGINE WORKS, GLASGOW.
PATENTEES AND SOLE MANUFACTURERS OF
CHAPLINS' PATENT STEAM CRANES, HOISTS,
LOCOMOTIVES, AND OTHER ENGINES AND BOILERS.
LONDON HOUSE:—
McKENDRICK, BALL, AND CO.,
QUEEN VICTORIA STREET, LONDON, E.C.



PARIS, 1867.
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH, 1867.
SILVER MEDAL, 1867.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the
Geographical Congress, Paris, 1875—M. Favre, Contractor, having
exhibited the McKean Drill alone as the MODEL BORING MACHINE
for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland
Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-
tive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10,
28'30, 27'10, 28'40, 28'70 metres. Total advance of south head-
ing during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tun-
nel, the McKean Rock Drill continued to work until the pres-
sure was reduced to one-half atmosphere (7½ lbs.), showing
almost the entire motive force to be available for the blow
against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these
Machines for the SEVERN TUNNEL; the LONDON AND
NORTH-WESTERN RAILWAY for the FESTINIOG TUN-
NEL; and the BRITISH GOVERNMENT for several Public
Works. A considerable number of Mining Companies are now
using them. Shafts and Galleries are driven at from three to
six times the speed of hand labour, according to the size and
number of machines employed, and with important saving in
cost. The ratio of advantage over hand labour is greatest
where the rock is hardest.

These Machines possess many advantages, which give them
a value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL
USE THROUGHOUT THE WORLD FOR MINING, TUN-
NELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the
most portable—the most durable—the most compact—of the
best mechanical device. They contain the fewest parts—have
no weak parts—act without SHOCK upon any of the operat-
ing parts—work with a lower pressure than any other Rock
Drill—may be worked at a higher pressure than any other
—may be run with safety to FIFTEEN HUNDRED STROKES
PER MINUTE—do not require a mechanic to work them—are
the smallest, shortest, and lightest of all machines—will give
the longest feed without change of tool—work with long or
short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or
open work. Their working parts are best protected against
grit and accidents. The various methods of mounting them
are the most efficient.

N.B.—Correspondents should state particulars as to
character of work in hand in writing us for information,
on receipt of which a special definite answer, with
reference to our full illustrated catalogue, will be sent.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,
IRON, AND FLEXIBLE TUBING.

The McKean Drill may be seen in operation daily in London.

MCKEAN AND CO.

ENGINEERS.

OFFICES,

42 BOROUGH ROAD, LONDON, S.E.; and
5, RUE SCRIBE, PARIS.

MANUFACTURED FOR MCKEAN AND CO. BY
MESSRS. P. AND W. MACLELLAN, "CLUTHA IRONWORKS,"
GLASGOW.

The Warsop Rock Drill

(Involving an entirely new principle in Mechanical Boring)

Requires only 20 lbs. steam or air-pressure.
Has only two moving parts—thus ensuring freedom from de-
rangement, and is absolutely self-feeding.
Is excessively light, and can be carried by one man, who can
with the No. 1 size (weighing only 35 lbs.) drill 40 holes
½ in. diameter and 1½ in. deep per minute, in the hardest Aber-
deen granite for splitting purposes.

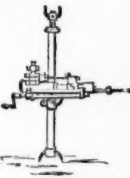
WARSOP AND HILL,
HYDRAULIC AND GENERAL ENGINEERS.
NOTTINGHAM.

STEAM and HYDRAULIC WINDING and PUMPING ENGINES
of all kinds.

DUNN'S ROCK DRILL,

AND
AIR COMPRESSORS.

DRIVING BED ROCK
TUNNELS, SINKING
SHAFTS, AND PERFORMING
OPEN FIELD OPERATIONS,



IS THE
CHEAPEST, SIMPLEST,
STRONGEST, & MOST EFFECTIVE
DRILL IN THE WORLD.

OFFICE,—193, GOSWELL ROAD

(W. W. DUNN AND CO.),

LONDON, E.C.

THE PATENT SELF-ACTING MINERAL DRESSING MACHINE COMPANY

(LIMITED).

T. CURRIE GREGORY, C.E., F.G.S.

OFFICES,—GLASGOW: 4, WEST REGENT STREET.

LONDON: 52, QUEEN VICTORIA STREET, E.C.

IMPORTANT NOTICE TO MINE PROPRIETORS.

MR. GEORGE GREEN, ENGINEER, ABERYSTWYTH.
SUPPLIES MACHINES under the above Company's Patents for
DRESSING all METALLIC ORES. Dressing-floors having these Machines pos-
sess the following advantages:—

- 1.—THEY ARE CHEAPER THAN ANY OTHER KIND IN FIRST OUTLAY.
- 2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED
BY DRESSING-FLOORS IS REQUIRED.
- 3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND
FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.
- 4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN
FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom
and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines
Darlington, Colberry, Nanthead, and Bollyhope; the Stonecroft and Greyside
Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the
Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esgar-
mwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines,
Darlington; also Mr. Sewell, for Argentiferous Copper Mines, Peru; the Brats-
berg Copper Mines, Norway, and Mines in Italy, Germany, United States of
America, and Australia, from all of whom certificates of the complete efficiency of
the machine can be had.

WASTE HEAPS, consisting of refuse chatts and skimpings of a
former washing, containing a mixture of lead, blende, and sulphur,
DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-
in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly
profit on our Nanthead waste heaps amounted last year to £800, besides the ma-
chinery being occupied for some months in dressing ore-stuff from the mines. Of
course, if it had been wholly engaged in dressing wastes our returns would have
been greater; but it is giving us every satisfaction, and bringing the waste heaps
into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines,
Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much
pleasure in stating that a full and superior set of your Ore Dressing Machinery has
been at work at these mines for fully a month, and each day as the moving parts
become smoother, and those in charge understand the working of the machinery
better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply,
and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines,
says—"Your machinery saves fully one-half on old wages, and vastly more on the
wages we have now to pay. Over and above the saving in cost is the saving in ore,
which is a much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The
separation which they make is complete."

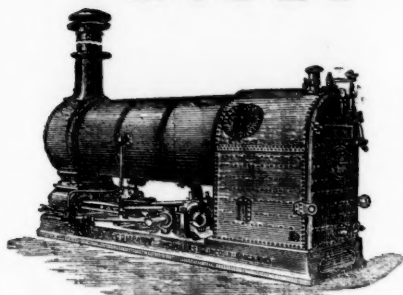
Mr. MONTAGUE BEALE says—"It will separate ore, however close
the mechanical mixture, in such a way as no other machines can do."

Mr. C. DODSWORTH says—"It is the very best for the purpose,
and will do for any kind of metallic ores—the very thing so long needed for dress-
ing-floors."

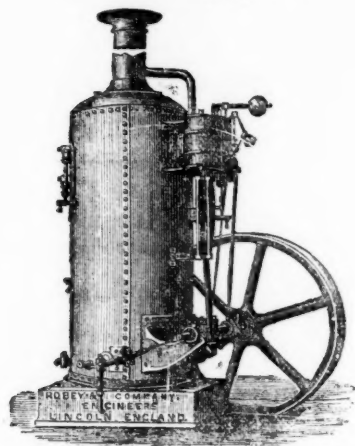
Drawings, specifications, and estimates will be forwarded on application to—
GEORGE GREEN, M.E., ABERYSTWYTH SOUTH WALES

ROBEY & CO., ENGINEERS, LINCOLN,

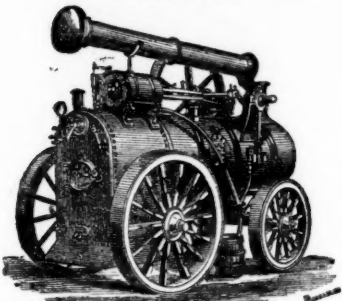
SOLE MANUFACTURERS OF THE



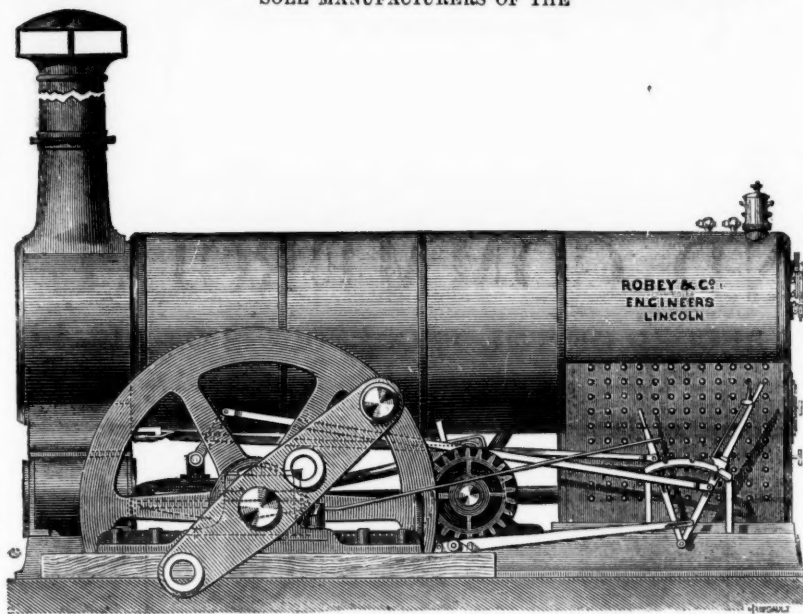
THE PATENT ROBEY FIXED ENGINE AND LOCOMOTIVE BOILER COMBINED, 4 to 50-horse power.



VERTICAL STATIONARY STEAM ENGINE AND PATENT BOILER COMBINED, 2 to 12 horse power.



SUPERIOR PORTABLE ENGINES, 4 to 50 horse power.



PATENT IMPROVED ROBEY MINING ENGINE,

OF ALL SIZES, FROM 4 TO 50-HORSE POWER.

Some of the advantages of this New Engine are as follows:—

SMALL FIRST COST. SAVING OF TIME AND EXPENSE IN ERECTING. EASE, SAFETY, AND ECONOMY IN WORKING. GREAT SAVING IN FUEL.

This New Engine is free from all the objections that can be urged against using the Semi-Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable in saving time and expense in fixing.

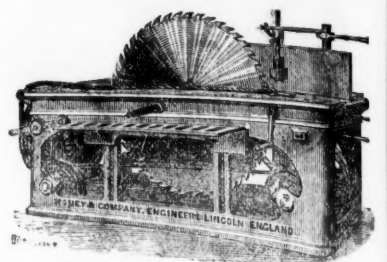
THE PATENT ROBEY FIXED ENGINE

(Also above illustrated) is admirably adapted for driving Rolling Mills, Saw Mills, Brick Machinery, Pumping Machinery, and all descriptions of Fixed Machinery.

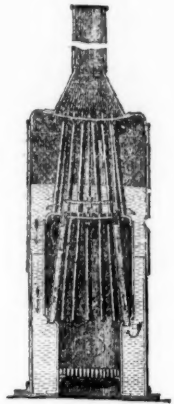
ENGINES UP TO 200 EFFECTIVE HORSE-POWER ALWAYS IN PROGRESS.

Prices and full particulars of all the Machinery here illustrated on application to the Sole Manufacturers,

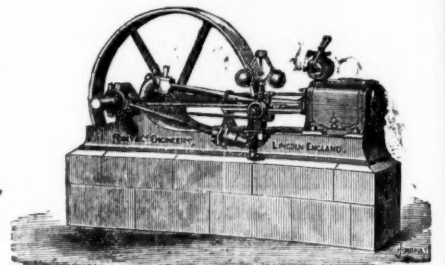
ROBEY & CO., ENGINEERS, LINCOLN, ENGLAND.
London Office: 117, Cannon Street, London, E.C.



SELF ACTING CIRCULAR SAW BENCH.



PATENT VERTICAL BOILERS, 2 to 12 horse power.



IMPROVED HORIZONTAL FIXED STEAM ENGINE, 4 to 60-horse power.

PATENT
"INGERSOLL ROCK DRILL,"
LE GROS, MAYNE, LEAVER, & CO.,
80, Queen Victoria Street, London, E.C.
5, PARK PLACE, NEW YORK, U.S.A.



We claim 40 per cent. greater effective drilling power, and offer to compete with any machine of its class

See following extracts from the reports of Judges in awarding Medals:—
"2. Its simple construction ensures durability, &c.
"4.—The steam or air cushions at each end of cylinder effectually protect from injury
"5. Its having an automatic feed, giving it a steady motion, &c.
"6. Its greater steadiness and absence of jar and vibration experienced in other drills, which is very destructive to their working parts, &c.
"7. Its greater power is some FORTY PER CENT. in favour of the Ingersoll."

Medals awarded for several years in succession "For the reason that we adjudge it so important in its use and complete in its construction as to supplant every article previously used for accomplishing the same purpose."
Estimates given for Air Compressors and all kinds of Mining Machinery. Send for Illustrated Catalogues, Price Lists, Testimonials, &c., as above.

JOHN AND EDWIN WRIGHT,



PATENTERS.
(ESTABLISHED 1770.)

MANUFACTURERS OF EVERY DESCRIPTION OF IMPROVED

PATENT FLAT AND ROUND WIRE ROPE

from the very best quality of charcoal iron and steel wire.

PATENT FLAT AND ROUND HEMP ROPES,

SHIPS' RIGGING, SIGNAL AND FENCING STRAND, LIGHTNING CONDUCTORS, STEAM PLOUGH ROPES (made from Wedder and Horsfall's patent steel wire), HEMP, FLAX, ENGINE YARN, COTTON WASTE, TARPULING, OIL SHEETS, BRATTICE CLOTHS, &c.

UNIVERSE WORKS, MILLWALL, POPLAR, LONDON.
UNIVERSE WORKS, GARRISON STREET, BIRMINGHAM.
CITY OFFICE, No. 5, LEADENHALL STREET, LONDON, E.

THE "CHAMPION" ROCK BORER

STANDS UNRIVALLED

For Tunnels, Mines, Quarries, Harbour Works, Cutting Blocks of Granite, &c.



The working parts are made of the toughest steel and phosphor-bronze—steel castings are also used—as to combine strength with light weight.

AIR-COMPRESSING MACHINERY

Of the simplest and best construction.

Combined Water-pressure Engines and Air-compressors, Giving most excellent results.

ULLATHORNE AND CO., 63, QUEEN VICTORIA STREET, LONDON, E.C.

Archer's New Patent Stone Breakers.

Sole Makers: DUNSTON ENGINE WORKS CO.,
GATESHEAD-UPON-TYNE, ENGLAND.

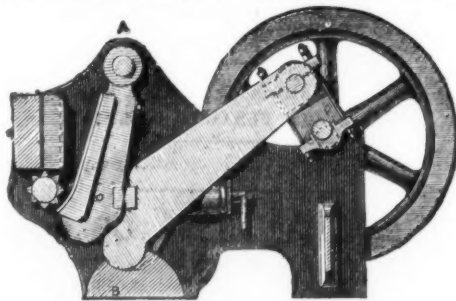
STONE BREAKER,

For Road Metal, &c.

Machines with combined Vertical Jaw and CUBING ROLLER.

Guaranteed to break more cubical and to make less small than any other Machine.

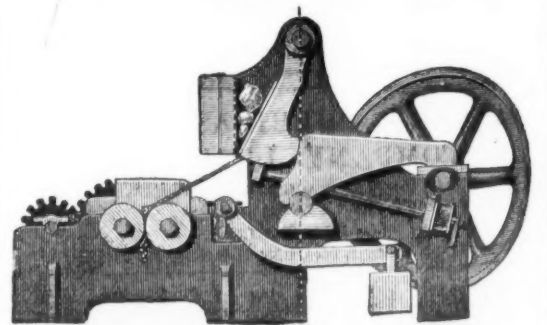
Simple Machines, with plain Vertical Jaws, without Roller.



PULVERISER,

For Crushing and Pulverising Rocks, Ores, Emery Stone, &c., &c.

Apply for prices and particulars to the Manufacturers, as above.



ARCHER'S PATENT BONE MILL—Sole Manufacturers.

MANUFACTURERS OF MARINE AND STATIONARY ENGINES; AND COLLIERY MACHINERY, CAGES, TUBS, &c., and every description of MACHINERY USED IN CHEMICAL WORKS.

Original Correspondence.

STAMPING MACHINERY.

Sir,—A valuable paper was recently read by Mr. John Hocking, at a meeting of the members of the Mining Institute of Cornwall, on Tin Stamping Machinery. As a supplement to this paper, the following information is given of the performance of some American Quartz Mills, constructed at the Union Iron Works, San Francisco:—

STANFORD MILL, AT WHITE PINE.

Silver Mill, Crushing Dry.

Number of mortars	6
Discharge of mortars	Double.
Number of stamps to each mortar	5
Total number of stamps	30
Weight of a stamp in pounds	750
Height of drop in inches	8
Number of drops per minute	95
Screens made of brass wire	—
Trade number of the screens	50
Tons of rock crushed in 24 hours	52
Tons crushed per stamp per 24 hours	1.73
Quality of the rock	Hard.
Formation	Limestone.
Fineness of the bullion	998

MEADOW VALLEY MILL, AT PIOCHE,

Silver Mill, Crushing Wet.

Number of mortars	6
Discharge of mortars	Double.
Number of stamps to each mortar	5
Total number of stamps	30
Weight of a stamp in pounds	750
Height of drop in inches	9
Number of drops per minute	85
Screens made of Russia iron, punched	—
Trade number of screens	6
Tons of rock crushed in 24 hours	67
Tons crushed per stamp per 24 hours	2.07
Quality of the rock	Tough.
Formation	Quartz.
Fineness of the bullion	550

RAYMOND AND ELY AT PIOCHE,

Silver Mill, Crushing Dry.

Number of mortars	6
Discharge of mortars	Double.
Number of stamps to each mortar	5
Total number of stamps	30
Weight of a stamp in lbs.	750
Height of drop in inches	8
Number of drops per minute	95
Screens made of brass wire	—
Trade number of the screens	50
Tons of rock crushed in 24 hours	48
Tons crushed per stamp per 24 hours	1.6
Quality of rock	Easy.
Formation	Quartz.
Fineness of bullion	775

INTERNATIONAL MILL AT WHITE PINE.

The International Mill has 60 stamps—30 crushing dry and 30 crushing wet. Silver Mill, crushing dry.

Number of mortars	6
Discharge of mortars	Double.
Number of stamps to each mortar	5
Total number of stamps	30
Weight of a stamp in pounds	750
Height of drop in inches	7½
Number of drops per minute	93
Screens made of brass wire	—
Trade number of the screens	50
Tons of rock crushed in 24 hours	33
Tons crushed per stamp per 24 hours	1.1
Quality of the rock	Soft.
Formation	Limestone.
Fineness of the bullion	990

Silver Mill, Crushing Wet.

Number of mortars	6
Discharge of mortars	Double.
Number of stamps to each mortar	5
Total number of stamps	30
Weight of a stamp in pounds	750
Height of drop in inches	7½
Number of drops per minute	87
Screens made of Russia iron, punched	6
Trade number of the screens	6
Tons of rock crushed in 24 hours	47
Tons crushed per stamp per 24 hours	1.57
Quality of the rock	Soft.
Formation	Limestone.
Fineness of the bullion	990

KEYSTONE CONSOLIDATED MILL AT AMADOR CO., CALIFORNIA.

Gold Mill, Crushing Wet.

Number of mortars	8
Discharge of mortars	Single.
Number of stamps to each mortar	5
Total number of stamps	40
Weight of a stamp in pounds	750
Height of drop in inches	8½
Number of drops per minute	85
Screens made of Russia iron, slotted	—
Trade number of the screens	5
Tons of rock crushed in 24 hours	90
Tons crushed per stamp per 24 hours	2.25
Quality of rock	Medium.
Formation	Quartz.
Fineness of the bullion	840

HUNTER'S VALLEY MILL, AT MARIPOSA CO., CALIFORNIA.

Gold Mill, Crushing Wet.

Number of mortars	6
Discharge of mortars	Single.
Number of stamps to each mortar	4
Total number of stamps	28
Weight of a stamp in pounds	650
Height of drop in inches	11
Number of drops per minute	70
Screens made of Russia iron, punched	—
Trade number of the screens	6
Tons of rock crushed per 24 hours	50
Tons crushed per stamp per 24 hours	1.75
In four-stamp mortars	1.83
In six-stamp mortars	—
Quality of rock	Easy.
Formation	Quartz.
Fineness of the bullion	—

ST. LAWRENCE MILL, AT NEWCASTLE, PLACER CO., CAL.

Gold Mill, Crushing Wet.

Number of mortars	1
Number of stamps to each mortar	6
Total number of stamps	6
Weight of a stamp in pounds	650
Height of drop in inches	10
Number of drops per minute	90
Screens made of Russia iron, punched	—

Trade number of the screens	5
Tons of rock crushed in 24 hours	17
Tons crushed per stamp per 24 hours	2.85
Quality of the rock	Brittle.
Formation	Quartz.
Fineness of the bullion	—

EUREKA MILL, AT CARSON RIVER, NEAR VIRGINIA CITY.

Silver Mill, Crushing Wet.

Number of mortars	12
Number of stamps to each mortar	5
Total number of stamps	60
Weight of a stamp in pounds	950
Height of drop in inches	9
Number of drops per minute	90
Screens made of Russia iron, punched	—
Trade number of the screens	4
Tons of rock crushed in 24 hours	159
Tons of rock per stamp per 24 hours	2.65
Quality of the rock	Easy.
Formation	Quartz.
Fineness of the bullion	980

WATER REQUIRED IN WORKING QUARTZ.

Each stamp uses 10 lbs. per minute. Each pan uses 16 lbs. per minute. Each settler uses 9 lbs. per minute. If the water is run from the mill into settling tanks it can be saved with a loss of 20 per cent. This will make the actual supply of water required in pounds per minute to be as follows:—For one stamp, 2; one pan, 3.2; one settler, 1.8.

POWER REQUIRED FOR A 60-STAMP MILL.

60 stamps, at 1½-horse power	67.5-horse power.
22 pans, at 4-horse power	88.0 " "
11 settlers, at 3-horse power	33.0 " "
3 concentrators, at 2-horse power	6.0 " "
1 rock-breaker	5.5 " "
Friction	25.0 " "

Total power required

225.0-horse power.

WATER REQUIRED FOR 60-STAMP MILL.

225-horse power will require per minute	169 lbs.
60 stamps	600 lbs.
22 pans	352 lbs.
11 settlers	99 lbs.

Total water required

1220 lbs.

Of which 1,051 lbs. used for stamps, pans, and settlers can be re-pumped to the tank at a loss of 20 per cent., and the 169 lbs. for the engine can be condensed at a loss of 50 per cent. This will leave the actual amount to be supplied as follows:—

20 per cent. of 1,051 lbs.	210.2 lbs.
58 per cent. of 169 lbs.	84.5 lbs.

Total water per minute

294.7 lbs. X.

THE MYSTERIES OF HUMANITY.

Sir,—In this free and happy land, which abounds with charitable institutions richly endowed, there is still no lack of benevolence. Human suffering in every form, whether it be from sickness, pecuniary distress, mental or bodily affliction, accident, or oppression, usually find friendly aid and speedy relief when publicly known, and a vast number of the British public still devote their primary energies to the discovery of more cases in which to apply their pecuniary excesses to the best advantage, and this in all the purity of true Christianity.

The abundance of wealth known to exist in this country, with its daily accumulations in the hands of the righteous, easily explains the magnitude of British beneficence; still there is a mystery in some of its details deserving mature consideration, with a view to extent its advantages to thousands of our fellow-creatures whose heavy claim upon our sympathies has hitherto been unheeded through the gross negligence of well-paid officials to listen to reason for the protection of human life entrusted to their charge.

"The sweet little cherub who sits up aloft
To keep watch for the life of poor Jack"
has done much to ameliorate the condition of British seamen, and to lessen their perils, but the poor miner, who grovels in darkness in a pestiferous and deadly atmosphere, always surrounded by imminent danger to life or limb, appears to have no guardian angel, and but very few friends.

Collieries belonging to noblemen and other private individuals are worked by men whose actual masters are absolute strangers to them and to their families; others belonging to public companies are even worse in this respect, so that something like 400,000 of this class of operatives have to look to an agent only, and not to their actual masters, to render and secure to them all the protection provided by law for their safety against premature death or mutilation.

With all the concomitant horrors of a miner's occupation there are but few acquainted, except those who from official knowledge cannot close their eyes to stubborn facts and statistics. These men become inured to the most appalling sights of human suffering, and some of them instead of encouraging investigation into valuable suggestions for improvement either actively or passively stifle enquiry. I need not travel out of the records of your own Journal to prove that philanthropic individuals like myself, although disinterested in every sense outside the question of humanity, always fail to move the obdurate hearts of such officials to pity, or to acknowledge by a word of thanks the unrequited labour of years to awaken in them a sense of shame for their past iniquities in the form of silent contempt. To justify the harshness of such language I challenge them one and all to deny that I have devoted much of my time for many years to the thankless task of convincing them as to the fallacy of furnace ventilation. That I have proved to demonstration a remedy for much of the human slaughter in collieries, and sought, but in vain, for their co-operation in the application of such remedial means without the slightest stipulation for ulterior reward. If, then, such facts be conceded no one can be better informed than yourself that in a pecuniary sense I have also done my duty in the miner's cause, and, therefore, it merely remains for me to appeal—probably for the last time—to your scientific readers to explain why it is that none of them will either deny my statements as to the cause of colliery explosions, or attempt to refute my suggested improvements. If fallacious let their fallacy be publicly explained, but if correct surely they are worthy of notice and fair discussion.

The vilest criminal whose life has been forfeited by the outraged laws of the land invariably finds friends in perfect strangers, whose zeal is untiring to save a single human life, however depraved, from a premature and ignominious end, and this is frequently encouraged by the daily and weekly press, but even this powerful organism is eloquent in behalf of the miners only when some vast destruction of life occurs, instead of raising its voice on behalf of science to prevent such calamities.

It is, therefore, to me one of the greatest mysteries of humanity that although many men and women in private life leave nothing undone which their conscience dictates as being a Christian duty, there are to be found among mining engineers, viewers, and owners of collieries men who seem determined to resist rather than to encourage any and every effort for the amelioration of the social condition of the mining fraternity, and to disregard all attempts to protect their lives from unnecessary slaughter. Let us hope they are few in number, but I shall anxiously await the result of this appeal to see how many, if any, of that class who will say a kind word or two upon the merits or demerits of the miners' long-tried friend—the man who successfully defeated the wily schemes to prevent the Legislature authorising the appointment of Government Inspectors of Mines; the individual who caused the re-insertion by the House of Commons of a clause expunged by the Lords, rendering it imperative to give notice to such inspectors of all deaths in collieries before the holding of inquests: the author of such clause, and author

of "Money v. Life," a "Review and Exposition of Colliery Casualties," supported by Parliamentary evidence," and other irrefragable proofs of long existing abuses; author also of "The Miners' Friend," and "Fiery Facts," an exposition of the iniquitous City coal tax, and an occasional correspondent to the *Mining Journal* for 27 years, always in the cause of the oppressed, and founder of the "National Institution," with similar objects in view.

In conclusion, I venture to repeat my former offer to revisit the Northern coal fields, for the purpose of submitting my plans once more for the inspection of all scientifically concerned, and if successful to make them a present of my long-cherished and hard-earned laurels, being fully content and amply rewarded by a sense of duty as a man and a Christian, if permitted to remove the foul blot which now causes the slaughter of our fellow-creatures by hundreds, hurried into eternity without a moment's warning, the fragmentary remains of whose bodies frequently defy recognition by their nearest and dearest ties on earth. Will any one of the mining engineers, viewers, owners, or inspectors deny this, or still remain silent and unmoved to pity?

Southtown, Yarmouth, July 24.

C. COLWELL.

PATENT EXPLOSIVES.

Sir,—Although it has been repeatedly stated in the *Mining Journal* that the most carefully conducted experiments of chemists who have devoted their lives to the manufacture and manipulation of explosives have proved that in all the nitroglycerine explosives—dynamite, lithofracteur, and the like—wherein the nitroglycerine is merely mechanically associated with the absorbent, whether this be kieselguhr, charcoal powder, or anything else, it is practically impossible to prevent their separation, and that the effect of such separation is to render the mass infinitely more dangerous than nitroglycerine itself, because from the assumed harmlessness the same precautions against accident are not taken. The evidence brought forward in the enquiry before the Wreck Commissioner concerning the loss of the Great Queensland—a fine vessel of 1800 tons burthen, and carrying 33 passengers and a crew of 36, which has been sacrificed through the decomposition of a so-called nitro-compound, the ship having been literally blown to atoms—proved the existence of a state of things thought to be impossible. The amount of carelessness displayed in the manufacture of the powder, in its packing and storage, and, indeed, in everything connected with it is really marvellous. The annihilation of the vessel appears to have resulted from the explosion of 2 tons of Patent Safety Blasting Powder, manufactured by the Patent Gunpowder Company, in North Wales. The company was established in 1872, but did not commence to make powder until 1875. They appear to have been particularly unfortunate in their selection of managers, the first being Mr. Hunt, who acknowledged that he was "an engineer, but no chemist," whilst his successor, Mr. Thistleton, was almost equally innocent of the science of chemistry, having derived the little knowledge which he might have possessed, but certainly did not display, from Professor Gardner, one of the lecturers at the Royal Polytechnic Institution, a most attractive place of popular scientific amusement, but not such a science-school as would be recognised either by the Pharmaceutical Society, or by the Chemical Society.

The patent gunpowder is a production made by treating wood pulp with acid, and it is a matter of the greatest importance to test the material at every stage of the manufacture, and this could only be done by careful chemical analysis, yet Mr. Hunt admitted that during the whole period of his residence at the works he never on any occasion tested any of the wood pulp from which the powder was made, nor any of the powder; and he candidly and honestly admitted that he did not know how to do it. In August, 1875, Major Ford found elsewhere, by accident, a cartridge in a state of decomposition in a box with detonators bearing the company's name; the cartridge was handed to Dr. Dupré, the Government chemist, and on his report Major Majendie at once telegraphed to Major Ford to visit the works. He found that Mr. Hunt was absent, and Mr. Oliphant, who was on the works, said he knew nothing about the manufacture; he also said they thought it safer to pack detonators and cartridges in one box. Major Ford took eight samples from different parts of the works, and all were found to be dangerously impure. The Wreck Commissioner's observation, that a person should deliberately undertake the manufacture of such an article as a nitro-compound five times as strong as gunpowder without any knowledge of its chemical properties, should during the nine months he was engaged have taken no steps to have it tested, should have packed it in the same box with detonators, and fastened the boxes with iron screws instead of copper, seemed almost inconceivable—will not be regarded as unjustified.

But little improvement seems to have been made under Mr. Thistleton's management. He had very little knowledge of nitro-compounds, and it was not until he had tried the dangerous experiment of re-dipping the spoilt powder left by Mr. Hunt, and broken the windows and burnt the shed, that he declined to continue the task, and suggested neutralising the acid with potash solution, and re-making the powder. A few days after the departure of the Great Queensland the secretary of the company, Mr. Lambert, reported what was called an accident to Major Majendie, and on Sept. 26, 1876, Major Majendie received a portion of a cartridge which was found in the factory after the accident, and it was found to be a very impure nitrocellulose. The company shortly afterwards reported that consumers' stores had been returned to the works, the whole of the materials carefully examined and entirely re-made. Mr. Thistleton has been replaced by a competent chemist in the opinion of the company, but as his name is not mentioned no opinion can be formed; the result, however, does not appear to have been satisfactory, for the Wreck Commissioner states that the powder had, indeed, improved, but was dangerously impure from first to last. These being facts why will not miners be content with well-known and practically tested

July 24.

GUNPOWDER.

THE ST. JOHN DEL REY MINING COMPANY, AND ITS CONTRACT FOR HIRE OF THE SLAVES OF THE LATE BRAZILIAN (CATA BRANCA) COMPANY.

Sir,—At a court held by the Juiz Municipal at Sabara, Mr. James Newell Gordon, the superintendent of the St. John del Rey Mining Company (Limited), of Morro Velho, and also British Vice-Consul for the province of Minas Geraes, was summoned to show cause why the blacks of the late Brazilian Company had been kept in slavery from 1859 to the present time, contrary to the clauses of the contract entered into between the companies, dated June 27, 1845.

It appeared that the contract was to the following effect:—The hiring was to be for 14 years, the payments to be made in London; all the children who came from Cata Branca to Morro Velho were to be free on attaining their majority, and all born during the continuance of the contract were to be free absolutely at the end of the contract with their parents. The contract expired in 1859, and all were, consequently, free and entitled to their liberty.

It appears that all the clauses relating to the freedom of the blacks have been systematically broken, and the blacks been kept in slavery. In 1859 a few, in consequence of having money saved up and deposited for their freedom, applied to Mr. Gordon for their letters, when he stated they must yet serve for 10 years, which those who lived did till 1869, when three only received their letters of freedom at his hands, signed by Mr. Gordon, which documents state the (Cata Branca) Brazilian Company to be extinct. In 1871 the Brazilian Government passed a law regarding slavery, making it compulsory to register all blacks before or on Sept. 30, 1872, under penalty of the owner losing all rights over his blacks, and their becoming free. It also appeared that in spite of the clauses expressly providing for their liberty, and which has expired for 12 years, Mr. Gordon mixed up the names of the Cata Branca blacks with the names of the blacks belonging to the St. John del Rey Company, and registered matriculated the whole of them as slaves belonging to the St. John del Rey Company (Limited).

The judge expressed much astonishment at this state of things, and how they could so long have existed; but it was explained that Mr. Gordon, from the great influence his position as superintendent

of the St. John del Rey Company, secured the election of the Government officers and officials whose duty it is to look into such matters, and from the fact that although it was well known at the mines and in the neighbourhood that the Cata Branca blacks were illegally held in slavery no legal proof could be produced, as the contract had never been registered, and, therefore, till the present time, when fortunately a legal copy of the contract had been obtained, nothing could be done.

The judge then made an order that Sr. Jacintho Dias da Silva be appointed trustee of the blacks, and the defendant be allowed 90 days to answer the serious allegations.

It appeared that the contract was for the letting and hiring of 221 men, 88 women, and 76 children (33 girls, and 43 boys)—385 human souls. It also appeared that all the children born have been kept in slavery, and the children of some of the children.

We are informed that on June 13 Mr. James Newell Gordon was summarily dismissed from his post of superintendent of the St. John del Rey Mining Company at Morro Velho, which event was celebrated with great rejoicings, parading of bands of music, and an immense display of fireworks.

There is no doubt all the slaves will receive their wages from the St. John del Rey Mining Company (Limited), amounting in the whole to a very large sum, and this, with the loss of their services, will be a most serious matter.

This event has caused a great sensation all through the mining district.

W. S.

DEFUNCT LIMITED COMPANIES.

Sir,—All the shareholders who attended the meetings held at the Guildhall Tavern must be painfully aware of the lack of duties performed by the late secretary and some of his directors. The appointment of directors, instead of being nominated by the shareholders for their knowledge of mining, were placed in that position by the late secretary, who so managed to keep them ignorant of the real state of things. It is of little use regretting the past; let the shareholders select such men at the coming meetings as know what mining is, and what ought to be done, and not, as in some Welsh mines, worked in the most disgraceful manner to suit the book of the secretary, under the threat of dismissal if not carried out. The Limited Companies Act has been, as applied to mining, disastrous to all interested, and disastrous to the mines also. Names and not men have received the fees who suited promoters; let us have no more of this, but earnestly and economically strive to develop the properties that survive the wreck by a strict enquiry into what is doing.—July 25.

OMEGA.

CLEANING AND SEPARATING EXCHEQUER SILVER ORE.

Sir,—I have been requested by Lord Poulett to write to you respecting an entirely new process of cleaning and separating gold and silver ore when first taken out from the mine. The invention or discovery is one made by a Mr. Maxwell Lyte, a man of high reputation and character as an analyst and chemist. He has lately analysed some of the ore from the Exchequer Mine, and finds it most rich—something like 12 lbs. 80 grammes to the ton. This ore was sent him by Messrs. Wickham and Co., his lawyers, in Essex-street, Strand. Up to-day the chemicals as well as the manner used in getting at the precious metal of mines is most expensive, owing to the quantity of mercury obliged to be used, whereas by Mr. Lyte's discovery this is done away with, and some very considerable sum of money per each ton saved. Lord Poulett tells me that you are sadly in want of a good metallurgist or chemist; I think, therefore, that it really is worth your while to pay serious and speedy attention to the purpose of this letter, and to instantly place yourself in communication with Mr. Lyte on the subject, and then to come over yourself and see him, when he will explain and demonstrate everything to you; or else invite him over to London to explain all to your company, but no time should be lost. Mr. Lyte says the quality of your silver is the best he ever saw in the world. I hope soon to hear from you in reply to this, and that you will give the subject your most serious and earnest consideration, and act at once, as it really is of immense value to you.

J. HOWARD VYSE.

Paris, July 19.

There is also the following testimony:—
We, the undersigned residents of Silver Mountain, the county seat of Alpine, hereby certify that we have resided in this county for the number of years set opposite to our names respectively. That we are well acquainted with the I. X. L. and Exchequer Mines in Scandinavian Canyon; many of us have worked in the mines, and that but for our firm faith and unshaken confidence in the ultimate success of these mines we should have left Alpine County long ago. We further believe that these mines are destined under Mr. Chalmers' management, if properly supported, to bring out the camp, and with it our interests therein, and that at no distant date. Given under our hands at Silver Mountain before and in the presence of T. W. Leggett, Notary Public:—

Names.	Years residence.	Occupation.
R. M. Ford, P.M. and J.P.	11	Postmaster.
Thos. J. Orgon, district attorney	11	Lawyer.
L. M. Buel, county clerk	4	Miner.
Jas. Davidson, under sheriff	9	ditto.
Thos. W. Leggett, county treasurer	11	ditto.
John J. Rice	11	ditto.
Levi Miller	13	ditto.
John Sanquet	12	Merchant.
Thos. Hyatt	12	Miner.
Joseph Mitchell	3	ditto.
J. Lomas	4	ditto.
Jacob Miller	5	ditto.
Nils Eld	10	ditto.
Peter Peterson	12	ditto.
Andrew Qualla	12	ditto.
J. Johnson	11	ditto.
H. Craig	11	ditto.
R. M. and A. C. Folger	10 1/2	Publishers.
Thos. Ogden	13	Resident and miner.
Hiram Wiser	10	Miner.
Jas. Roush	3	ditto.
Wm. J. Auberg	2	Engineer.
P. F. Ahlstrom	2	ditto.
Thos. Edlingham	2	Miner.
J. H. Beaver	1 1/2	ditto.
H. C. Ginn	1	Car enter.
Peter Olson	13	Miner.
J. H. Hammond	11	ditto.

State of California, county of Alpine, S.S.

In witness whereof, I have hereunto set my hand and affixed my official seal, at my office, in the county of Alpine.

THOMAS W. LEGGETT, Notary Public.

THE EXCHEQUER, AND THE COMSTOCK LODES.

Sir,—As a shareholder I have received the "analysis and remarks on the recent report of Mr. Price." Like many others with whom I have conversed, I certainly agree with Mr. H. Sewell that this report is full of remarkable incongruities. Mr. Sewell most conclusively replies to these obvious inconsistencies. Mr. Price says:—"That because the Exchequer veins are not contact lodes, like the Comstock, &c." But is the Comstock a contact vein? On all hands it is admitted that the greatest geologist in the United States is Prof. Clarence King, who is favourably known to the English public. Now, upon this question of the Comstock, what says this great authority? Clarence King, in his exhaustive "Report on the Comstock Lode" (vol. III., page 27), makes the following important statement:—"That only during the middle of its course does it occupy a line of contact between syenite and the propylites." "North of the Ophir (Clarence King says) the lode is walled on both sides by propylite (or porphyry); south of the Gold Hill divide it leaves the syenite, and is carried southward chiefly in propylite." From the same chapter (section 2, page 37) "the lode is stated to be 22,000 ft. long," and on page 38, Clarence King says "that for only 4800 ft. does syenite form the west wall," and on the same page "even to the north and south, where it continues wholly in propylite." He also says (page 39) "the propylites sometimes loses its porphyritic texture." Again, page 42, "deposits of silver occur in the quartz distributing themselves capriciously in segregated bonanzas, separated from each other by intervals of entirely barren gangue, or of ore so poor as to be unworkable."

Again, page 45, "Ore was wholly wanting in the Crown Point workings of this (Comstock) vein down to 39 ft., above the 500 ft. level, where 130 ft. east of shaft and 60 ft. south of its plane a small silver deposit made its appearance, occupying 20 ft. of the quartz body, narrowing as it descended, and entering it as a wedge. In

the Yellow Jacket, on the same level, a small body of workable ore, 30 ft. long and 20 ft. high." At page 46, "No ore in the vein of any width till 730 ft. level in Yellow Jacket, where it was 20 ft. wide."

Then as to the result of the run at the Exchequer Mill. At page 55, Clarence King says, "All ore selections are made by the miner's eye, the constantly changing percentages in the rock defying a general estimate. The only true value is gotten by mill returns."

It will not be disputed (because the ore has been received in London) that the Exchequer Mine has produced stones of ore that will yield from \$500 to \$5000 per ton. Now, where did they come from? Of course, from below, where there is no doubt plenty of it.

One more quotation and I have done. At page 74 Clarence King says, "After this had been stopped away it was found that the next zone was composed of large blocks, showing no ore on the outside but extremely rich inside."

Mr. Clarence King's statements as to the Comstock not being a contact vein effectually disposes of Mr. Price's off-hand assertion. Who advised our directors to obtain the opinion of Mr. Price? Has he ever had any experience in silver mining or in any description of mining? Upon enquiry, I hear that he is simply an assayer in San Francisco, although he had something to do with the ill-fated Independence Gold Mine, and now occupies a similar position in connection with an obscure hydraulic mine which has been working for many years without any result to the shareholders save a perpetual increase of capital. Why did not our directors engage the services of some acknowledged authority upon silver mining, whose report upon our property would have been received by us with confidence and without suspicion? This has to be done before any proper conclusion can be come to.

July 25.

A SANGUINE SHAREHOLDER.

EXCHEQUER GOLD AND SILVER MINING COMPANY.

Sir,—On May 8 a circular was issued by the executive of the Exchequer Company stating that Prof. Thomas Price, of San Francisco, had been appointed to check the statements of Capt. Nettle as to the value of the ore on the mine dump, and in that circular Prof. Price was described as having a well-established reputation in this country and California, both as an experienced mining expert and as a practically scientific metallurgist, and it was anticipated that his report would dissipate the feelings of uneasiness then experienced. These facts were fully stated in the Mining Journal of the Saturday following. Prof. Price's report, so far from dissipating the uneasiness, has proved that the most gloomy forebodings as to the prospective value of the mine were justified. But because Prof. Price's report is unfavourable it is now sought by the same executive that so highly commended him in May to show that he knows nothing of either mining or metallurgy, which anyone with the feelings of an Englishman will say is most unfair, and I doubt whether the effort now made to discredit him will have any other effect than still further to shake the confidence of the shareholders, and to give even more weight to Professor Price's opinion than it would have had otherwise.

Prof. Price states that the company's properties are situated in Silver Mountain, Alpine County, California, and that the geographical and geological features of the district having been already described, he will confine himself to actual developments at the present time and future prospects. The present working vertical shaft is 450 ft. deep, or fully 600 ft. on the course of the vein: five different levels have been opened, varying from 200 to 900 ft. long on the course of the fissure, but so far without resulting in the discovery of any paying quantities of ore. The fissure, though well-defined, is but very irregularly filled with quartz, and the latter contains but very little silver ore. The silver generally, as sulphide, is very diffused, and in very small quantities, but as it generally occurs in very thin flakes, it would at first sight lead one to think the ore rich, and occasionally very rich stones are encountered, but they prove a very insignificant portion of the whole mass of the vein. The average assay of 300 tons of selected ore yielded only \$7 per ton. Seven samples taken from the hard rock during the two days he was at the mine yielded only \$4 per ton. The 800 tons of ore now at the mill, which has been selected from all the workings with great care, only assays \$5 1/2, not enough to pay one-half of the milling expenses. From the above fact it is evident that up to the present time the prospects are of a most discouraging character. He has given careful attention to the underground workings, as developed by levels, drifts, and cross-cuts, and has no hesitation in informing them that up to the present time they have no available profitable ore reserves. If any exist they must be much deeper. . . . The company are in good condition for future prospecting, having their roads built, substantial hoisting works in place, and a well contrived mill for extracting the precious metals when discovered. . . . There are several discouraging features connected with the mining properties of this district, which are as follows:—1. Notwithstanding that a very large amount has been performed at various points, yet in no instance has any considerable amount of paying ore been extracted. 2. In all promising metalliferous districts rich deposits are found in some of the veins either near the surface or at no very considerable depth, hence the encouragements in such districts to prosecute work to greater depth. 3. The company's vein is not a contact vein, or one situated between two dissimilar formations. All of the company's veins are contained in trachyte, and totally unlike the great Comstock Lode, which has syenite for a foot-wall and trachytic porphyry for the hanging-wall. The chances of discovering any considerable ore bodies in the immediate future are not of a very encouraging character; if any exist they must be at a very great depth.

The report, of which the above is a full *précis*, has been placed in the hands of Mr. Henry Sewell, who, somewhat unprofessionally, questions his colleague's ability, forgetting that Prof. Price, writing of American mines and veins, bases his statements upon facts ascertained with regard to them, while all that Mr. Sewell shows is that in Saxony, Spain, Mexico, Chili, Bolivia, and elsewhere good mines have been found under conditions similar to those existing at the Exchequer. These facts were, doubtless, as well known to Prof. Price as they are to all other mining engineers and professors—they are recorded everywhere—but Prof. Price states that in the particular district upon which he reports the conditions existing at the mines about which he was giving an opinion had not proved favourable. The notion that a man was sent to report upon the working of a furnace where there was practically no ore to work in it need not be discussed. Mr. Sewell is of opinion that possibly the rich ore has escaped laterally, and there is not the slightest doubt in his mind that a body of rich ore exists somewhere in the mines. Though this is somewhat indefinite—a little on the "where 'tis there 'tis" principle—I hope Mr. Sewell's opinion will prove correct, but until then it is but reasonable to ask that Prof. Price's should have a little

Old Broad street, July 25.

FAIR PLAY.

EXCHEQUER GOLD AND SILVER MINING COMPANY.

Sir,—The manner in which the directors of this company have dealt with the report of Professor Price shows that they argue somewhat thus—if we employ a man to examine our mines we pay him for a useful report; that is to say, useful for sharedealing and capital raising purposes. If after examining our property he reports unfavourably he must be incompetent, or wanting in integrity. Some would consider this a *non sequitur*, and many shareholders unconnected with the board will prefer a truthful report, though unfavourable, to a glowing one written to orders, whether expressed or implied. The opinions of various persons are given as opposed to that of Professor Price, but it is unfortunate that of the list given but one gentleman can be mentioned—Mr. J. J. Cooper, M.E., who was recommended by Messrs. John Taylor and Sons—whose opinion is worth the paper it is written on. All the others are in the happiest ignorance of mining, most of them never having been in a dozen mines in their life, and then only under the guidance of practical miners, like infants in the hands of nursemaids; the remainder have either never been in a mine or owe their position to mere book knowledge. And it is still more unfortunate that Mr. J. J. Cooper and Professor Price virtually agree with each other that there is at present no mine worthy the name in the Exchequer dis-

trict, but that at considerable depth—1000 feet—there is a chance of finding one. Why, there are almost as good prospects as these in Cornwall, Wales, or Ireland without going 5000 or 6000 miles to look for them.

Another point is that the directors claim to have received information that while at Silver Mountain Prof. Price expressed himself to Mr. Arnott, of the Vulcan Ironworks, San Francisco, and to Mr. Folger, proprietor of the Alpine Chronicle, to the effect that his report would be very favourable. If this be fact, it is the more to his honour for being employed by the directors of the Exchequer Company, it would have been dishonest to his employers to have given other persons the advantage of priority of information which might have been used to the prejudice of both directors and shareholders. It may be he failed to follow Artemus Ward's example in saying "this is irony" when he made the statement; it may be that he recollected another American wit's statement that "leeches can only relieve themselves by vomiting, and if you be attacked by a newspaper leech be careful to let him have only such blood as he may vomit to your own advantage," or it may be, which is the more likely of the three, that the news that the report was to be favourable was cabled to England, and being acted upon by those in (?) the secret prevented their getting out of their shares before the market was gone. All these, however, are but suppositions, and suppositions which would never have existed but for the manner in which the report, because adverse, has been received.

There can be no doubt as to the accuracy of Mr. Lewis Chalmers' statement that the mine was not looking well on Mr. Price's visit, and this being so, how could the executive suppose that a man of Prof. Price's reputation would, in the face of that fact, write a favourable report? Mr. Chalmers states that there were no bunches of rich ore in sight, and experience has proved that these bunches have never been sufficiently numerous to make the mine pay cost—even Mr. Chalmers admits that the grade of ore, as well as the output, will have to be improved. Mr. Chalmers's suggestion to sink to the 1000 ft. level is really only what would naturally follow Prof. Price's report if it be determined to continue the mine at all; though, for my own part, I would much sooner try another and more promising mining district altogether. The fact that an assistant of Prof. Price found \$26 9-10 gold and \$145 3-10 silver in a stone of ore which he assayed also corroborates Prof. Price's statement that very rich stones of ore are occasionally met with, though their occurrence is so rare that they are scarcely worthy of consideration, while the publication of an assay of one of the ore stones is positively delusive. No one will rejoice more than I if the improvement in the 400 ft. level proves permanent, but the general character of the district certainly does not warrant such a hope. The directors say that in requesting Mr. Price to visit Silver Mountain they "were more desirous to have his opinion of the O'Hara furnace than with regard to the mine, as they were informed that he is an authority more particularly on metallurgy." I should not like to have the shadow of a suspicion that our directors are playing fast and loose with us, but I cannot shut my eyes to facts.

I am aware that men sometimes lose in their old age the ability they possessed in the prime of life, but I never before heard of a man's technical ability utterly fading in three months, though some who are green and youthful are wonderfully altered by three months' experience. May I ask how it happens that if the directors were informed in May that Prof. Price is an authority, more particularly on metallurgy, they were led to state in that very month that he "had a well-established reputation in this country and in California both as an experienced mining expert and as a practically scientific metallurgist." The directors surely cannot declare that on behalf of the shareholders they appointed a man about whose antecedents and position they knew nothing, or that knowing his antecedents and position they knew them to be shady. It would be unjust to the directors to accuse them of such dereliction of duty. All their actions prove the contrary, and especially now that we have their statement as to the minute enquiries they have made concerning Mr. Henry Sewell, who it is rumored is to be sent out in the hope that "his report will dissipate present feelings of uneasiness"—to use the words employed when Prof. Price was appointed. In connection with the investigation of Mr. H. Sewell's character, the enquiry has been almost insultingly minute, and that the questions which must have been put to him were answered at all, considering his reputation and experience, can only be attributed to the excessive politeness he inherits from the Chilean lady who has the privilege of being his mother. Not only have the Exchequer directors collected enough materials to write his biography, but they have ascertained the names of all the professors and teachers at the school in which he studied, obtained information as to interesting incidents which have happened in the lives of his brothers, and even ascertained to whom he was married—a fact which, although sometimes woman rules, can scarcely be regarded as material for determining whether a man is competent to examine a mine.

The directors say that Mr. Price is not infallible, and probably even the Professor himself does not claim infallibility, but he has certainly shown his practical and commercial wisdom in taking the average value of the ore, and the general prospects of the mine and district, as deduced from ascertained facts obtained in the actual opening out and development of mines by the Exchequer Company's officers, and those of neighbouring mines, rather than making a long and tedious search for a promising-looking stone of ore, or even for a sackful of good-looking mineral, and then leading the shareholders to suppose that these "slogging stones" are the average yield of the mines. Prof. Price is entitled to the best thanks of the shareholders for boldly stating facts which will benefit the directors, as being among the largest shareholders, more than many others.

Junior Carlton, July 24.

INVESTOR.

MINING—ITS MANAGEMENT AND ABUSES.

Sir,—It is to the Mining Journal that the public are indebted for their knowledge as to the sayings and doings in all matters connected with mining—as to whether shareholders are pleased or displeased, whether in mining enterprises fortunes have been made or fortunes lost, if resulting in profit or loss, in success or in ruin, &c. That the latter should be the rule—particularly in foreign mines—is not to be wondered at, for it would appear as though London mining boards of directors, being totally ignorant of mining themselves, and consequently as to the necessary and indispensable qualifications of the mining manager, selected this functionary possibly on account of his incapacity, for his unfitness for the post which he is to occupy. Otherwise—as "kissing goes by favour"—being a relative, friend, or lackey of someone connected directly or indirectly with the concern, is recommended as a person possessing all things—every suitable qualification; whereas he possesses nothing, is totally ignorant of the business which is confided to his charge; should he happen to have been recommended by Professor Snodgrass, F.G.S., it is quite enough, the Professor being as ignorant of mining as all the rest of the professors, as well as of the necessary qualifications of the person whom he recommends; but for the ignorance of the unqualified manager, and others equally unqualified, the poor dupes of shareholders have to pay. This they have proved to their sorrow, and many to their utter ruin. What has become of the forty American mines, absorbing ten millions of English capital, and which two or three years ago figured in the London Stock Exchange, and which have dropped into silence? No mention is now made of them. Scarcely one American mine out of the number was ever managed by a man who knew aught of mining. The Emma, for example, for which 1,000,000 sterling was paid, is not an exception. Their first manager was a Californian banker, who was succeeded in the management by a young man who was never a miner in his life—a nephew, I am told, of the late Prof. Forbes, by whom, of course, he was recommended; and the fact of his having been recommended by Prof. Forbes was amply sufficient, Professor Forbes having managed to induce the people of London to believe that he himself was an oracle in mining. What a delusion! Professor of what was Mr. Forbes? A highly respectable man he, doubtless, was, and by some unaccountable ingenuity managed to be appointed consulting mining engineer of several companies. Unaccountable ingenuity, did I say? Rather should

Now, Sir, if these reports mean anything they mean to convey to the shareholders the impression that there had been no cessation of the sinking of the north shaft since the last setting-day. Judge, then, my surprise when on reading Mr. Rowe's report, dated the 14th, I found that during the month the sinking had been delayed for nearly ten days from the breaking of one of the main rods. If such contradictory reports are sent what confidence can the share-

holders have in their agents' reports? If the sinking of the north shaft was discontinued for a third of the month, why did the agents report that it was being sunk week by week? I do hope my brother shareholders will insist upon an explanation, and that the directors will do their duty in this matter. Well may confidence in agents' reports be shaken if such glaring inconsistencies are allowed by the directors. So far the directors and agents are the only parties who have benefited by the mine, and I for one think it is high time the shareholders should rouse themselves and look a little closer into these matters. Had the shareholders in Glyn, Van Consois, Penstruthal, and Cathedral done so they would not have been in the plight they are now. Two agents for a small mine like North Laxey seem to me to be an unnecessary expense, and the sooner one or other of the two is dispensed with the better.

A SHAREHOLDER IN NORTH LAXEY.

NEW CONSOLS.

SIR.—No news ever reached me of a more surprising kind than that New Consols was insolvent. I doubt if any mine in the county has been more shamefully handled than this has been by those who caused it to be brought into liquidation. Why did they do it? It would almost seem that they might cheat the creditors; or was it that they might come into a good property cheap? I find that they have been offering the labourers 10s. in the pound, and I suppose they wish the other creditors to come off with less. The creditors should place the mine in Chancery in the event of not receiving their claims in full, because it is said that 500l. per month was charged for interest on money advanced on shares, and that 10,000l. more or less, was charged for the mine. A Chancery investigation would doubtless elicit such an amount of selfishness as is rarely to be met with. How long the liquidation is to take I know not, for no intimation of a close has been made.

LOOKER-ON.

Calstock, July 24.

UNITY WOOD.

SIR.—Being in the neighbourhood of Unity Wood on Thursday last, I was informed that a meeting of the adventurers was to be held that day, and that it was likely it would be determined to abandon the works. I took the opportunity of attending, and it was, indeed, resolved to stop and to sell the materials. This is another instance of the effect of the low price of tin, and I suppose that others will follow ere long. I have been informed that the Unity Wood water will find its way into West Poldice, where the engine is very small—only just sufficient for its own water. So that West Poldice Company must either erect additional steam-power, stop the mine, or take Unity Wood engine and keep it at work. The best course would be to consolidate the two sets, and call them "West Poldice Consols."—July 21.

TORRIST.

P.S.—Since I wrote the above I have seen a letter from Mr. Hawke, a West Poldice shareholder, in which he says the Unity water will not affect West Poldice. I should be pleased to find it so, but I am doubtful.

BRIGHAM CAVERN.

SIR.—I have never seen this cavern, although I have visited Brixham, from which the name is derived. This cavern has been notorious during the last few years from the circumstance that the flints found in it were alleged to be flint implements—knives, &c.—of human workmanship, and regarded as evidence of the great antiquity of man. So much importance was attached to the discovery of these flints that in July, 1858, a committee was formed for exploring the cavern. This committee was promoted by the Royal and Geological Societies of London, and a fund was raised to defray the expenses of the exploration, which was carried out by a local sub-committee, of which Mr. Pengelly, F.R.S., is said to have been the most laborious member and personal inspector of the whole proceedings. The work lasted 12 months, but it was not until May 16, 1872, that the report of the committee was presented to the Royal Society, nor until late in 1874 that the exhumed flints were deposited (at the Christy Museum, London) for public inspection, so that for 15 years the public has had no opportunity of examining the specimens, but the committee quickly decided that they were "flint knives, relics of man, and manufactured tools." Mr. Pengelly, the late Sir Charles Lyell, and other eminent geologists were unanimous in adopting those flints as furnishing incontestable evidence of the contemporaneous existence of man with the extinct mammalia of the Drift period, and it was said that the exploration of the Brixham Cavern "produced an entire revolution of opinions on the antiquity of man."

In October, 1874, Mr. N. Whitley, C.E., of Truro, a lover of all truth, visited the cavern, and afterwards drew up a paper entitled "A Critical Examination of the Flints from Brixham Cavern, said to be 'Knives and Human Implements.'" This paper was read before the members of the Victoria Institute, and Philosophical Society of Great Britain, at 10, Adelphi-terrace, Strand, London, and subsequently reprinted from the Journal of that society, a copy of which I have now before me, with a report of the discussion which followed the reading. The gentlemen who spoke on the subject agreed generally with Mr. Whitley's views, being satisfied that the geologists who believed in the "knives and human implements" rested their faith on a sandy foundation. I cannot do better than quote some of the concluding paragraphs of Mr. Whitley's lecture to exhibit the errors of the savants who ignorantly sanctioned that belief:—

"I am aware of the weight of authority which must be attached to the high names whose opinions I have here combated, but I have at least this vantage ground that I stand on well-ascertained facts, and on these alone, and dogmatic assertions can no longer be considered a reputable logic of facts, the only certain foundation on which to build scientific truth. * * * I have now shown that the so-called 'thirty-six rude flint implements of indisputable human workmanship' are for the greatest part small undefinable pieces of rubble flint, mixed with a few imperfect subsoil flakes. * * * That the marks of use or secondary chipping, so strongly asserted to be found on the edges of the flints, and so clearly shown on the wooden Fig. 410 in 'Ancient Stone Implements,' are not to be found in the flint itself. * * * That the flint described in 'Ancient Stone Implements' as a remarkably symmetrical scraper, and said to be found in the cavern, was not found there, but in the soil without and above it. * * * That the cast of a very perfect flint knife exhibited among other relics in the cavern, and sold to visitors as a cast of a cavern specimen, is a deception. * * * That the portion of a cylindrical pin or rod of ivory, said to be found in the cave, was not found by the committee of exploration, is not now with the flints in the Museum, and that there is no evidence to show that it is a cavern specimen. * * * That the charcoal bed contains no charcoal; that slate has been mistaken for flint, and flint for bone; and that the description given of the 'whole hind leg of a cave bear'—the most famous specimen of the cavern—has been found to be so loaded with erroneous facts and false conclusions that its evidence has been withdrawn and abandoned."

It is astonishing that the gentlemen of the committee who are regarded as men of high attainments in science should have so readily concluded that the flints were "knives" and "human implements," and I think that Mr. Whitley's *exposé* of their errors will have the effect of making them more cautious in their future investigations, inducing them to reason before coming to conclusions. In thinking of the labours of the committee, the following old sayings have come to my remembrance:—"Much ado about nothing," and "The mountain laboured and brought forth a mouse."

I see from a catalogue subjoined to Mr. Whitley's lecture of the papers read before the members of the Victoria Institute that the following were furnished by him—"The Palæolithic Age Examined," "On the Brixham Cavern, and its Testimony to the Antiquity of Man examined." These two papers were anterior to that which is the subject of this letter.

Mr. Whitley is an honorary secretary of the Royal Institution of Cornwall, of which he has been a member about 40 years, and during that long period he has been a diligent student of what the late Mr. N. Ennor called "Nature's secrets." He has devoted a large amount of time and money to and in the pursuit of geological science, and this merely from a love of it. It has been to him what people call a "hobby." His investigations have not been confined to the British Isles, but have extended to the Continent, so that in reasoning upon a subject in that favourite science he can fetch evidences from abroad as well as from home. In replying to the discussion on his paper on the Flints from Brixham Cavern he said, "Mr. Row has spoken of the immense number of flints found in the South Downs, and I can fully confirm his statements. On Gisbury Hill, north of Worthing, you may shovel up the split flints and flakes

by cart-loads, and from thence to Eastbourne they are abundant everywhere on the surface, but more especially on the high ground, and where the down land has recently been brought into cultivation they are turned up from the subsoil to the surface by the plough. On the chalk high lands of Central France the flakes and the so-called tools are even more numerous, especially in the province of Poitou and Perigord; and what is still more remarkable, they occur in similar quantities in wide-spread deserts, where man, savage or civilised, never could have made his permanent home." A more complete demolition of a hastily-formed theory cannot be conceived than that made by Mr. Whitley of this knife and implement dogma. Mr. Whitley has contributed scores of essays to the Royal Institute of Cornwall, besides those furnished to other scientific societies, which will have placed him in the list of advanced geologists.—*Truro, July 23.*

R. SYMONS.

MYSTERIOUS DISAPPEARANCE.

SIR.—Some years ago a letter in the Journal referred to the disappearance of a man, aged about 40, from a village in Gwynnapp in October, 1846. He went to Redruth on a market or fair day, stopped at an inn, where he drank two or three glasses of grog with some friends, who left him there, but never saw him again. It was said that he was seen by a woman, near Wheal Cupid, on his way home, and that it was probable he fell or was thrown into the engine-shaft in that mine. The mine was drained a few years afterwards, and no remains were found. Then it was said that he must have fallen into one of the shafts in Wheal Damsel. That mine was also afterwards drained as deep as he could have fallen, and no remains were found. It was then suggested that because his probable invention for the extraction of gas from water was likely to supersede the gas extracted from coal, the manager of the gasworks at Redruth put him into an oven, and consumed him. I knew him well, and feel sure that he would not have committed suicide; he loved life too well for that; there can, therefore, be no other conclusion than that he was murdered for the sake of what property he had about him. A friend tells me that he saw him change a 5l. note that he might lend a sovereign, so he had about 4l. in gold, and he had also a gold watch and chain. He was known to have resorted to a house of ill fame in Redruth, and the discovery of human bones on the premises about 15 or 20 years ago, when the premises underwent alteration, lead us to suppose the women disposed of the body there after robbing the man of his watch, chain, and money. An investigation succeeded the discovery of the bones, but of course no proof could be adduced to establish the guilt of anyone after the lapse of so many years.—*July 25.*

—Sinking shaft, 192 fms. 2 ft. 10 in.; winzes, 150 fms. 5 ft.; levels, 685 fms. 1 ft.; slopes, 2650 fms. 5 ft. 2 in.; total fathoms, 3850 fms. 2 ft. 10 in. Total sales to May, 1877, 19,990 tons 2 cwt. 0 gr. realising 154,982l. 10s. 6d. made and paid to date of present balance-sheet, 58,200l. The mine is in good working order, and when the lode is cut into and explored at the 193 fms. shaft, to winze we shall resume our usual sampling of 150 tons a month, and I trust that from that time forward regular dividends will be the rule and not the exception.—*ARTHUR WATERS.*

The following supplemental report from Capt. A. Waters, dated July 19, was read:—

July 19.—Since the date of my general report Watson's shaftmen have been working regularly eight hours, a core relieving in the place from one o'clock on Monday morning until 12 o'clock on Saturday night pushing forward the 193 cross-cut, and this morning reached the wall of the great lode; the length of the cross-cut is 3½ fms., or nearly 5 ft. more than the 180 cross-cut, proving that the lode is nearly perpendicular between the two levels, and, therefore, most likely to continue productive in depth. We have bored into the lode 3½ ft., all the distance apart and lead ore, but have not reached the footwall; as far as we can judge from the borings and the flow of water out of the hole there is every probability of finding a rich mine when the lode is fully cut through and explored east and west of the cross-cut. There can be no two opinions on this point, at any rate this question will be solved by the end of next week. The 180 east after being winzeled up, i.e., from a lode of 7 ft. wide to 18 in.—is now opening out again, and is now worth 2 tons per fathom, and improving daily. The 180 west is also opening out again, and is now worth 2 tons per fathom, with every prospect of opening out again, the bunch corresponding to that seen in the 142, and which was called ore great was driven 5 fms. through poor ground, is now in a lode worth 2 tons per fathom, and every prospect of considerable further improvement. It would seem that the lode in the bottom of the mine, and that the great lode will in future make headway through every obstacle, and be more or less productive from shaft to shaft, and to the other true lodes of the Shropshire district. We are driving the 152 cross-cut north to intersect the side lode at a point 25 fms. west of Watson's shaft. At the 120 we are driving east of Madox's cross-cut, and west of Watson's, which is looking very promising. At the 92 we are driving east and west of cross-cut on old lode, which is 3½ ft. wide, worth 1 ton per fathom. In the 42, about 100 fms. east of Watson's shaft, we are cross-cutting from old lode south towards the several side lodes known to exist in that direction, all of which are likely to be found productive against the shaft. The old lode in this part of the mine is about the adit and 74 yielded over 30,000l. worth of lead ore, and the side lodes in question traversing the same beds of country cannot, in my opinion, fail to yield ore in considerable quantities. The mine is in splendid working order at surface and underground. As may be seen by any shareholder who takes the trouble to examine for himself, and I conclude this report by saying that we are only now beginning to work this great lead-producing property.—*ARTHUR WATERS.*

Mr. GREENSILL said the directors in their report stated—"Your directors have also received several other notices of motions it is proposed to submit to the meeting to-day, but, being irregular, they cannot be entertained, and, even if passed, they could be of no binding effect." He wished to know in what respect these notices of motion were irregular?—Mr. EDRIE asked what number of the shareholders resided in London, to whom it would be inconvenient to attend meetings if always held at the mine?

The SECRETARY replied that more than 100 of the shareholders resided in or near London. Of course, holding the meetings at the mine would be convenient to those living near it, but to those resident in London and the South of England it would be inconvenient.

Mr. EDRIE asked why the Chairman had not signed the directors' report?—The CHAIRMAN, in reply, said he did not sign the report because he did not altogether agree with it. A committee of the Wolverhampton shareholders—Messrs. Cooper, Shaw, Greensill, and Cremonini—some time back sent in a requisition asking the directors to convene a special meeting, to consider the advisability of increasing the number of directors. Although they were not bound to do so, one-fifth of the shareholders not having signed the requisition, the directors decided to call the meeting after the ordinary meeting that day, and notices to that effect had been sent out on the 4th inst. The Wolverhampton committee then sent out a circular referring to the non-payment of a dividend, with which he agreed, and also as to his selling of shares. When he joined the board he held 100 shares, and he now held nearly double that number. He (the Chairman) still held nearly double the number of shares he had when he joined the board, and he denied the right of anybody to call this into question. He thought it was rather sharp practice to send this circular out to get the start of the directors, and to send out proxies, one of which had been returned signed in his favour.

Mr. GREENSILL admitted the sharp practice. The CHAIRMAN said the resolution which would be proposed was that in accordance with clause 8 of the Articles of Association—the (the Chairman) should be removed from the direction, and that Mr. E. D. Shaw should be elected in his stead. In the directors' report the names of four candidates from Wolverhampton for seats on the board were given, but the directors recommended two of them only, and he, not wishing to make any selection, had refused to sign the report. He wished to say something with regard to the mine. The Wolverhampton committee said they were not satisfied with the recent results of the company's operations, nor was he himself. At the previous annual meeting he congratulated the shareholders on the position of the mine, for at that time Capt. Waters believed he would be getting good results from the old mine as well as the returns from the new part of the mine, but the returns had since fallen off, as they had to sink through hard ground. Formerly the lode went down with the shaft, where it was comatable at three points, but he had had to sink in hard ground, and the returns had fallen off; but he supposed Capt. Waters would explain that though they had not the money in reserve they certainly had the ore.

Mr. EDRIE asked to which resolutions the directors referred as being irregular. They were, he believed, discussing the report at present.

The CHAIRMAN did not admit that it was the directors' report. Mr. PETER WATSON stated most distinctly and most emphatically that it was the directors' report, for although one of the directors—the Chairman—refused to sign it, it was still the report of the board.

Mr. EDRIE repeated his question as to the irregularity of the notices of motion.—The CHAIRMAN replied that prior to any special meeting the shareholders should have ten clear days' notice, and this had not been possible in the time allowed by the Wolverhampton committee.

The SECRETARY said the notices of resolutions on'y arrived on the Saturday morning, and it was impossible to get circulars printed so that the shareholders should have them on Monday, so as to give them the legal notice. A special meeting could only be called at the request of one-fifth of the registered shareholders, holding one-fourth of the capital of the company. Besides, there was no requisition or request of any kind for a special meeting, only notices of resolutions to be proposed at the meetings called, which were not in order, and invalid *ab initio*.

In the course of a discussion on this point, the CHAIRMAN stated that the notice as to the directors was quite legal, as that referred to business which could be transacted at an ordinary meeting, but the other resolutions could not legally be put unless a duly constituted special meeting were held for the purpose.

Mr. CREMONINI hoped the Chairman would not in any way put a stumbling-block in the way of what his friends and himself considered a fair request. If he would fall in with their views he was willing to forego an unpleasant task in making remarks which would probably be disagreeable.

The CHAIRMAN said shareholders could say what they pleased. He had been advised not to come to the meeting, as he would be insulted and annoyed, but he was quite willing to be insulted and annoyed as much as the shareholders liked, and he would indemnify the *Mining Journal* for publishing all that took place.

A SHAREHOLDER said they only wanted facts. They had not come there to insult anyone.

Mr. EDRIE asked for the name of the Chairman's informant? The CHAIRMAN said he had not heard any name, but Mr. CREMONINI had himself spoken of saying disagreeable things.

Mr. EDRIE thought the Chairman should impute the remark to Mr. Cremonini, and not to the Wolverhampton shareholders as a body.—Mr. CREMONINI said if the Chairman acceded to the wishes of the shareholders, of which he was aware, everything would pass off agreeably. He was most anxious that there should be unanimity at the meeting, and that no disagreeable remarks would have to be made.—The CHAIRMAN remarked that he only wished the business to be conducted in a legal manner.

Mr. EDRIE moved the adjournment of the meeting for four weeks.—Mr. GREENSILL having seconded the motion, the CHAIRMAN pointed out that if a meeting were not legal, no adjournment would make it so.

Meetings of Public Companies.

TANKERVILLE MINING COMPANY.

The annual meeting of shareholders was held at the account-house at the mine, near Minsterley, Salop, on Thursday, the 19th inst., as briefly stated in last week's Journal.

Mr. ROBERT WILSON presided.

Mr. J. H. MURCHISON (the London manager and secretary) read the notice convening the meeting, and the directors' and agent's report, which with the accounts were taken as read. The following are the reports:—

Your directors have circulated the balance-sheet, and a full report from Captain Waters, both of which will have informed you of the work done in the past year, and the position and prospects of the mine. You will observe that for the twelve months ending April 20 last 1393 tons of lead ore were sold for 19,451l. 1s. 3d., being an average of 14l. 18s. 6d. per ton, against 1829 tons for 27,408l. 15s. 4d., or 15l. 1s. 2d. per ton in the previous 12 months. The quantity and price of ore sold being thus less, your directors were able to divide only 8000l. against 12,000l. the previous year. Your directors regret that they have not yet had the means of declaring a dividend in the current year, but from the prospects of the mine they trust, with the manager, that the former samplings of 150 tons per month will soon be resumed, from which he hopes regular dividends will be made. Your directors have received several notices of motion for the ordinary and extraordinary meeting called for to-day. Among these is one for holding all the annual meetings at the mine. On this point they would remark that there are 380 shareholders in the company, and of these 77 reside in Shropshire and at Wolverhampton and neighbourhood, holding about one-fourth of the shares. To the remaining 300 shareholders, holding the other three-fourths of the shares, London would be a more convenient meeting place, and your directors recommend that the annual meetings be held alternately at the mine and in London.

Notices have also been received that it is intended to propose that the directors be increased from the present number of four to seven, being the maximum number allowed by the Articles; and there are six candidates for these additional seats at the board, in case it shall be decided to make such elections. The candidates are: Mr. William Cooper, of Wolverhampton, holding 550 shares; Mr. Edward Dethick, of Wolverhampton, holding 350 shares; Mr. Thomas Deakin Greensill, of Wolverhampton, holding 150 shares; Mr. James Cremonini, of Wolverhampton, holding 220 shares; Mr. Andrew Good Brookes, of Shrewsbury, holding 100 shares; Mr. Alfred Russel Wallace, Rose Hill, Dorking, holding 120 shares. Your directors recommend that if the shareholders desire to increase their number Mr. William Cooper and Mr. Edward Dethick Shaw be elected, they being the two largest shareholders proposed in the notices received. Your directors have also received several other notices of motions it is proposed to submit to the meetings to-day, but, being irregular, they cannot be entertained, and, even if passed, they could be of no binding effect.

One of your directors—Mr. Peter Watson—goes out of office at this meeting, and offers himself for re-election, as do the auditors, Messrs. Brandt, Stansfield and Co., public accountants.

July 19.—Watson's engine-shaft is now 192 fms. below the boat level, and 224½ fms. from surface. The pump is fixed, rods in place, shaft divided and cased, and machine kibble winding from the bottom of the mine. We have driven the 192 cross-cut south towards the lode 2 fms., and calculate to get fully into it in 6 or 7 feet further driving. No stone will be left unturned to get into the great lode this week. The 180, west of shaft, is in a lode 4 ft. wide, worth at present 2 tons per fathom. Although the lode has fallen off in value in this end the last day or two, still the indications point to our near approach to a cavity, west of which we may expect great improvement in the value of the lode. Supposing the dip of the ore from the 142 downwards to be uniform, the said 180 end is west to where the great run of ore seen above should come in, and the present end being very wet is fair evidence that our calculations as to the west bunch are about to be verified.

The winze, 8½ fms. behind the said end, is down 4½ fms.; the lode throughout is worth 4 tons per fathom. The 180 east, now over 15 fms. from shaft, continues to go forward in a lode 6 to 7 ft. wide, carrying two ore courses, the hanging part being worth 3 tons, and the footwall portion 1 ton per fathom. This end is laying open rich ore ground for slopes in back and bottom of the level. The winze in the bottom of the said level, 10 fms. east of shaft, is down 2 fms.; the lode throughout is worth quite 4 tons per fathom. Seeing that over 35 fathoms in length has now been opened in ore ground along this level, and looking at the lode in bottom of the winze east, and of that west of shaft, I do think we may look to the cutting of the lode in the 192 with considerable expectation. The slope in back of the 192, east of shaft, is worth 3 tons per fathom. The slope in said level, east of No. 1 winze, is worth 2 tons per fathom. The slope west of winze is worth 2 tons per fathom. The slope in same level, west of No. 2 winze, is worth 3 tons per fathom. No. 2 slope, west of ditto, is worth 2 tons per fathom. The 167, west of shaft, is 80 south of the 142, and the lode is gradually improving as the end advances. I value the end to-day at 1 ton per fathom, but, from the splendid leadstuff just blasted out, we may reckon on an early improvement in the lode. There is no change of note in the 167, east of shaft, for the last week or two, and it is at present a difficult question to decide whether the run of ore now in the 180 is still in front of the 167 or standing by the side of that drive. We must explore the ground in a miner-like way to prove the points. The winze below the 152, east of shaft, is now deep enough for the purpose for which it was started—to enable us to drive west behind the south side of Watson's shaft to get to a run of ore worth 2 to 3 tons per fathom, ground that could not be worked direct from the shaft without risk to the pumps, and hindrance to the dispatch of stuff through the regular outlet to surface. I may say here that said run of ore ground appears to be a continuation of the bunch now to be seen in the 180 east. The rise in the 130, west of shaft, on south part of the lode, is worth 2 tons per fathom, with good ore in each end. The slope in said level west of shaft, but east of rise, is worth 1 ton per fathom. The 120 west towards said rise is yielding good stones of ore, but the end is not yet far enough to catch the main bunch of ore. The winze below the 110 west of shaft, on south lode, is worth 2 tons per fathom.

The 92 cross-cut, north-west towards old mine, is 2½ ft. into what appears to be a great lode, composed of carbonate of lime and good stones of lead ore; the value improves as the cross-cut advances. This is evidently one of the great lodes, if not the great lode, of the old mine, and our intention is to cut it through to the full width, and then go east on its course to the great cavity and ore ground known to exist in the bottom of the 74, about 15 fathoms east of the old engine shaft. It is impossible at present to calculate the exact dip of the cavity and run of ore ground, but 10 fathoms east of the present 92 cross-cut is likely to be sufficient to meet with the object in view.

We feel persuaded that when this part of the old mine is properly laid open by the said 92 an important addition to the resources of the mine will be the result. The last annual report made special reference to this point, and it was hoped that we should long ago have been able to go down in the cavity and work the ore ground below the 74, and thus add to the returns of the mine. We have cleared out the level, and entered upon the work, but were soon driven out by a great influx of water, the result of heavy rains, which, as you know, lasted four months, and nothing but a steam engine for pumping would have brought us out of the difficulty. This much by way of explanation. The slope in the 80 south of shaft is worth 25 cwt. per fathom. In the 42, east of old engine-shaft in the old mine, we are cross-cutting south towards four side lodes known to exist there, and upon which important discoveries may be made. We have ample pumping and winding power, and it is our intention to explore the mine lengthways and sideways to a greater extent than has ever been done before.

Ground sunk, driven, and stoped from February, 1870, to May 1877, as follows:

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The CHAIRMAN: That appears to be the important and rich part of the lode. But there is another important point—that is the east lode from Roman Gravels at the same depth. In the 63 it is worked from $1\frac{1}{2}$ to 2 tons. If we get anything like so good a result in the cross-cut we shall keep up the returns.

Capt. WATERS: I think we shall get as much from our east lode as we are getting altogether at Roman Gravel.

Mr. SIDONS: We heard they were drowned out on the main Roman Gravel lode.

The CHAIRMAN: We are not quite so deep, and they drain us; On the whole, I think it is so far satisfactory. We have, as I have told you, very good points working on, and it does appear that during next year our returns will be increased 10 tons a month, which would more than pay expenses and the interest on the preference stock. A further additional 10 tons would give us something on the ordinary stock. I do not think at all that the market price of our stock is the proper price. I think there is nothing more that I need speak about, but Capt. Waters will, I am sure, be happy to answer any questions which you may wish to put. I will now move—"That the report of the directors, with the report and balance-sheet, be passed and adopted."

Mr. CHARLES J. HILL: I have pleasure in seconding that.

Mr. CREMONINI asked if Mr. Crawshaw was still the chairman of the board?—The SECRETARY said Mr. Crawshaw had not resigned, but as he had been absent for some time in consequence of ill health, Mr. Pyne had acted as chairman for the past six months.

Mr. CREMONINI said it would be recollected that last year he raised an objection to the last new allotment of shares, the capital on which was not called up. He wished to know how much of the capital had been called up since the previous meeting?

The SECRETARY replied that the amount not called up was £1489.

Mr. CREMONINI said the shareholders would perhaps recollect that the new capital was to be raised for the purpose of developing the mine. Having visited the mine he found, according to his judgment, that the mine if properly worked would prove beneficial to the shareholders, and he had applied for some shares and paid them up in full. He had impressed strongly on the minds of the directors that the mine should be vigorously developed with the 20000 in hand. He was sorry to see that the working had not increased at all, and he found that only about the same number of men were employed as before the previous meeting. He thought the money would gradually be consumed in expenses, without any benefit to the shareholders, if a more vigorous course of working was not pursued. He was not sufficiently acquainted with the working of mines to dictate to the directors what should be done, but he was of opinion that if capital were subscribed for a certain purpose the capital should be applied to that purpose. (Hear, hear.) He would not blame the directors if it did not prove successful, but he would blame them for not working the undertaking with sufficient energy. (Hear, hear.) Of course if the directors would prove that his judgment was wrong he would apologise for his remarks.

Capt. WATERS wished to reply to Mr. Cremonini, as his remarks were a reflection on the management, though he might not mean them to be so.

Mr. CREMONINI disclaimed any intention of blaming Capt. Waters.

Capt. WATERS said if the mine were his own and he had the wealth of a Rothschild he would work the mine as it had been worked. (Hear, hear.) Of course, if they had a large capital in the bank to draw upon every time the cost-sheet became due he would have gone on working the old mine, for he believed there was a good shale bunch there, but with the amount of money available he believed the mine was being worked as it should be, and he maintained that it was being worked as vigorously as possible under the circumstances. There was not a mine in the kingdom where a shaft had been sunk with greater speed than their boundary shaft had been. They had been driven out by water six months at a time, but they could not be held responsible for the elements, but the moment he saw that sixpenny worth of work could be got for sixpence the work was done. So far as the boundary part of the mine was concerned, it had been worked most vigorously. As to driving on the foot-wall part of the lode at the 75, they were justified in doing this, because that part was the bearing portion of the lode in the upper levels; but it had changed like the lode had at Roman Gravel. Such mistakes must occur—if mistake it could be called—and he was quite willing that the workings should be examined by the most eminent mining engineers in the kingdom. He believed the mine to be a good one, and that in years to come the great Roman vein would be found in it. If the mine were his, and he had the money, he would sink a shaft 150 fms. deep close to the boundary, where he believed the Roman vein would be found. This was not detracting anything from the wealth of Roman Gravel, for there was plenty of ore there for their time, and posterity would have to look after itself.

Mr. SIDONS asked why the whole of the capital had not been called up?—The CHAIRMAN replied that the reason why the whole of the capital had not been called up was because it was not required at once, and as it carried 15 per cent. interest it was thought better to call it as required. Mr. Crawshaw was quite willing to pay up whenever required.

Mr. GREENSILL asked if more men could not be judiciously employed in working the mine? Year after year the capital was dribbling away, and the balance was nearly gone. If possible he thought more men should be employed. He wished also to ask if the directors had acted legally in appointing a fifth director, for he thought the Articles provided for four directors only?—The CHAIRMAN said the Articles gave power to elect five directors.

Mr. GREENSILL thought that Mr. Crawshaw was appointed without the consent of the shareholders.

The SECRETARY produced the minutes of the general meeting of August 5, 1875, respecting Mr. Crawshaw's election, and remarked that Mr. Greensill was himself present at that meeting.

Capt. WATERS said with respect to Mr. Greensill's question as to having more men, the shareholders were aware that the boundary shaft had been sunk as fast and as regularly as possible. It was now down to the 86 fm. level, and the shaft men were driving out to cut the lode. As soon as the 86 fm. level end was far enough from the shaft to put the men out of danger the sinking of the shaft would be resumed, but this could not be done until the men would be out of danger. The 75 fm. level was being driven with a full body of men, and as soon as the 86 fm. level was driven 7 or 8 fathoms beyond the shaft they were going to sink the shaft, and lay open the ground for stoping. All the stopes were working with full crews of men.

Mr. AVES asked with respect to the driving of the 75 fm. level if Capt. Waters had not tried whether he was working on the hanging-wall or the footwall of the lode? Was there no means of testing this so as to find out the error?—Capt. WATERS said he had already explained that in the upper levels the footwall was the productive part of the lode. If they had made a cross-cut they would have had to go 3 or 4 fathoms without finding out the mistake, and this would not have been justifiable, as the footwall and not the hanging-wall had been productive hitherto from the surface to the 60 fm. level. He had not found out what the actual state of the lode was until the winze was reached, and he would have gone on driving the 86 fm. level if it had not been found that the hanging-wall was becoming productive. This was a misfortune for which nobody could be blamed.

Mr. AVES asked with respect to the sales of ore in January, February, and March how it was that there were three consecutive payments outstanding?—The CHAIRMAN said he had intended to explain that the payments for ore sold are either made in cash, with 1½ per cent. discount, or in bills at three months. The Barry Port Company had always paid in bills, which had up to the time of the failure been punctually met. The matter was now being discussed amongst mining companies, and he hoped that an alteration in the mode of payment would be the result.

Mr. CREMONINI hoped that every effort would be made to get cash payments in future. (Hear, hear.)—The CHAIRMAN replied that the directors would do all they possibly could to get an improvement in the manner of payment, but by themselves they could not alter the rule of the trade.

The reports and accounts were then unanimously adopted.

Mr. SAMUEL YORK proposed the re-election of Mr. Joseph J. Pyne as a director of the company with a great deal of pleasure, for it would be impossible to have a more industrious man on the board, or one more devoted to the interests of the company.—Mr. CRE-

MONINI had pleasure in seconding the proposition, which was carried.

The CHAIRMAN, in returning thanks, said he had been connected with the company from its commencement, and he had always firmly believed in its success, especially in the south boundary part. It had not been opened up quite so quickly as he had expected, but he hoped that it would be a dividend-paying concern before long.

On the motion of Mr. GREENSILL, seconded by Mr. SIDONS, the auditor, Mr. E. Ashmead, was reappointed.

Mr. CREMONINI moved a vote of thanks to the chairman, directors, and managers of the mine for their attention to the interests of the company during the past year, expressing a hope that during the current year greater progress would be made in the development of the mine.—Mr. COOPER seconded the motion, which was carried unanimously.

Capt. WATERS remarked that any blame as to the working of the mine should be thrown on himself and his brother agent, and not upon the directors, who had never dictated to them how the mine should be developed.

Mr. GREAME said if they had gone on working the old mine all the capital would have been spent before this time. It should be borne in mind that the price of lead was 2½ per ton less than it had been, and this had also told against them.

The CHAIRMAN having returned thanks for the compliment passed the proceedings terminated.

PARYS MOUNTAIN MINING COMPANY.

An extraordinary general meeting of shareholders was held at the offices of the company, St. Helen's-place, on Monday (Mr. J. Y. WATSON, F.G.S., in the chair), for the purpose of passing the following resolution, if deemed expedient:—

That the Morfa-du portion of this company's sett and fixtures and machinery thereon be sold to a new limited company, proposed to be formed under the Companies Acts, 1862 and 1867, having an original capital of 11,2500.—In 11,250 shares, of 10 each—one of whose objects is to be the purchase and working of the same, and which company is intended to be called the Morfa-du Mining Company (limited), and that such sale be for the sum of 50000, payable by instalments, such instalments to be paid or secured at the times and in the manner expressed in a contract already prepared and submitted to this meeting, in the schedule to which contract the property included in the sale is described, and that such sale be on the terms contained in, and the company's seal be affixed to, such contract.

In the circular accompanying the resolution the directors stated as follows:—

The above resolution deviates from that passed at the extraordinary general meeting, held here on May 10, because the directors found that there were legal impediments in the way of carrying them out. It will be remembered that what may be termed the original scheme contemplated the assignment of a portion of the Parys Mountain sett for the sum of 40000, in cash and bonus shares, but it was found that the company had no power to dispose of any of their rights for shares. After mature consideration and consultation with several large holders, the directors submit the above resolution, in the confident conviction that the terms will meet the views of the proprietors, and provide means to develop the Parys Mine proper, and the new sett. The new company presents unusual promise of success, and the board urge upon their co-shareholders to subscribe for the new shares, and so at the same time ensure the prosecution of the cross cut at the 91 south, to get under the great open cast. Since the meeting of May 10 several small branches of ore have been intersected, and the indications as the open cast is approached are most promising. The directors desire to impress upon shareholders that the future of both mines depends upon the successful carrying out of this scheme, as without further capital the Parys Mines cannot be carried on.

The CHAIRMAN said that Mr. Taylor, the legal adviser of the company, was present, and would be happy to give any further information.

Mr. TAYLER said the contract was on the table, and could be seen by any of the shareholders.

The SECRETARY said the contract provided for the sale of the Morfa-du portion of the Parys Mountain sett, for the sum of 50000, payable in instalments in the manner therein set forth.

A SHAREHOLDER asked if 11,0000 were to be raised, what was the 50000 for?—The CHAIRMAN said that 50000 went to the Parys Mountain Company in payment for the portion taken, and 60000 went to the new company to work the Morfa-du portion.

Mr. F. BRABY, a director, explained that the Parys Mountain owned two distinct properties—one called the Old Parys Mountain and the other the Morfa-du, but owing to the want of capital to work both the Morfa-du had been left unworked. But the Morfa-du was always thought to have good value, and the proposal was to separate the property into two companies; as, indeed, they were separated geographically. As a matter of fact, more money had been given for the Morfa-du property than was now proposed to be paid for it, but more money was wanted to develop the lodes, and push on under the Great White Rock, before it was believed that it would become profitable.

A SHAREHOLDER: I understood at the last meeting that 7000 was required to make the Bluestone available; why was not that attempted before you asked for this 60000?—The CHAIRMAN explained that unless they worked the Parys Mountain now it must stop. As regarded the Bluestone they did get some of the rock and sold some, but at the then price it would not pay, but now there were offers in the office for 3000 or 4000 tons a year at a price which would be remunerative; therefore, by obtaining the money now proposed the directors hoped to be able to work the Parys Mountain, and place it in a good position.

On the motion of the CHAIRMAN, seconded by Mr. LUCAS, the resolution given above was then unanimously carried.

The SECRETARY said the resolution must be confirmed at a future meeting, but in the meantime the prospectus of the new company could be submitted to the shareholders. He might mention that a great many letters had been received in the office from the shareholders, all of whom had signified their intention of subscribing for shares in the new company; one gentleman thought that a number of free shares should be allotted to shareholders in the new company, but that could not legally be done, as Mr. Taylor, the solicitor advised that the directors could not issue bonus shares.

The CHAIRMAN said the committee proposed to issue the new shares in the proportion of one new share to every two old shares, and if not taken up, of which, however, there was but little doubt, they would be offered to the public.

The SECRETARY: Some will take up their full number, others more. There will be no great outlay necessary to work the Morfa-du.—The CHAIRMAN said that for about 7000, he believed they would be able to place ore on the market.

The SECRETARY said the suggestion of the committee was that 5s. should be paid on application, 2s. 6d. on allotment, 2s. 6d. in three months, and the remaining 10s. by easy instalments.

A SHAREHOLDER: It may be possible that you may not require it at all.—The SECRETARY: It will be very unlikely that it will be all required.

Mr. BRABY remarked that all the plant and machinery on the Morfa-du property came to the new company.

A SHAREHOLDER asked how the cross-cut was getting on in the Parys Mountain?—The SECRETARY replied there was no change according to the advices received on Saturday. There were 25 fms. still to drive to get to the outside wall of the open-cast, but there was the chance of lodes being cut every day.

In answer to a further question, the SECRETARY said that copper remained steady at a low price. (A laugh.)

The confirmatory meeting was then fixed to be held on August 7 next, and the proceedings terminated.

LLAN GAN LEAD MINING COMPANY.

The first ordinary general meeting of shareholders was held on Tuesday, at the Great Western Hotel, Birmingham.

Mr. HENRY WRIGHT (chairman of the directors) in the chair. The directors present were—Messrs. G. Smith, F. Burt, S. Walker, and T. Parker. There were also present—Messrs. A. E. Walton (the company's consulting engineer), Capt. Thomas Wasley (manager), George King Patten (secretary); and amongst the shareholders present were—Messrs. James Richards, F. Hanis, J. T. P. Whittle, James Parker, G. A. Panton, C. H. Jones, W. H. Wright, Gordon Smith, J. F. Bellis, J. H. Chandler, C. Baker, J. Pitt, G. A. Richards, James Richards, &c.

The SECRETARY read the notice convening the meeting. The directors' report stated that considerable delay occurred in the delivery of the machinery, which was followed by weather so unfavourable that it was not possible to get the engine, pumps, and crushing machinery into working order until the middle of March. The sinking of the engine shaft was then resumed, and has been rapidly pushed forward. The development and improvement in Wright's lode, and on the lode at the old engine shaft, as they descended were of

a most encouraging character. Several tons of lead were forwarded to Swansea for sale in May, and other parcels had followed. In the prosecution of the work for a profitable and complete development of the mine it was necessary to incur an outlay beyond the present subscribed capital, and the directors recommended that the nominal capital should be increased to the extent of 20,000, by the issue of 1600 additional shares of 5s. each, which would make the total capital 20,000—a moderate sum for such an undertaking. The successful opening of a mine of so much promise, with a plant efficient for greatly extended operations, in a mine of so time, and with such a small outlay, is a very unusual occurrence in mining. The report of Mr. A. E. Walton, M.E., stated that the general progress of the mine had been well and substantially built. That the shareholders possessed a very valuable property, and their prospects were more encouraging at the present time than they had been at any period.

Capt. WASLEY (manager), after fully reporting upon the property, and the different works carried out under his superintendence, said he had rarely, if ever, met with a mine that promised so great a success to the shareholders in so short a time.

The CHAIRMAN, in moving the adoption of the report and statement of accounts, alluded to the sales which had been effected during the last three months, and said the company had thereby made a profit of 2880, which was equal to 5 per cent. on the cash outlay, or 2½ per cent. on the capital of the company. The development of the mine had been steadily improving, and they now had rich leaders of lead. He felt confident that at the end of the next year they would have a more satisfactory report to present than the present one.

Mr. RICHARDS, in supporting the adoption of the reports and accounts, stated that he had recently visited the mine on his own account, and could confirm the statements made by both the Chairman and the reports. He went underground, and traced the leaders down to the bottom of the winze, and found they were larger than at the top, thus showing a marked improvement in depth. He was pleased with the machinery, floors, &c., and all were in good working order. He was so satisfied with the undertaking that he should take more shares.

Mr. SMITH (deputy chairman) said that the mine had only been started a year, and in that short time they had sent parcels of lead to the market, a very unusual thing in mining, and this mine compared most favourably with the best mines, some of which had taken from five to ten years to open.

Capt. WASLEY in reply to several questions by shareholders, said that were he in a position he should have no hesitation in subscribing for 100 shares. He had every confidence in the mine. Every fathom that the mine had been sunk the outlay had improved. The engine shaft was now down 20 fathoms, and the ore cuts would shortly be commenced. So soon as the lodes were intersected, and in that short time they had sent parcels of lead to the market, and the ore was of high and confident opinion of the future prospects of the mine. He could only express his high and confident opinion of the future prospects of the mine.

Mr. WHITTLE asked several questions, which on being answered he said that the replies given were most satisfactory. He had never attended a meeting where so much explanation and detail had been afforded, and he should certainly have some of the new issue—not a few, but many.

Mr. WALTON explained the various workings, and exhibited a model illustrating the proposed way of opening and developing the mine. He also pointed out on the plans the different points from which the specimens of lead were taken, and in that short time they had sent parcels of lead to the market, and was satisfied both with the mine and its management that on his return he purchased more shares, and he should now take more than his *pro rata* quantity.

A SHAREHOLDER enquired if the directors and officers intended to take any of the proposed new issue?—The CHAIRMAN replied that the whole of the directors and officers had such confidence in the mine that they would take their own shares. After a few further observations from shareholders, the adoption of the report and accounts was unanimously carried.—Mr. RICHARDS proposed the re-election of F. Burt, Esq., as the company's public accountant, which was duly carried. The retiring auditor, Mr. G. Cox, public accountant, was re-elected.

The meeting was then made an extraordinary one.—Mr. GEORGE KING PATTEN, the secretary, having read the notice making that meeting was for the purpose of authorising an increase of capital from 12,000 to 20,000. He would simply say in the words of the directors' report that the increase would be both wise and profitable.

Mr. RICHARDS proposed the following resolution, which was seconded by Mr. WHITTLE, and unanimously carried:—"That the capital of the company be, and it is hereby, increased from 12,000, its present amount, to 20,000, by the issue of 1600 additional shares of 5s. each, and that the said shares be offered *pro rata* to the present shareholders. Any residue of shares which may not be thus taken by them, to be allotted to such persons and at such time as the directors may deem expedient."

Mr. RICHARDS proposed, and Mr. JONES seconded, a cordial vote of thanks to the Chairman and directors, which was carried by acclamation, and was responded to by the Chairman.

Mr. PARKER proposed a vote of thanks to the engineer and officials of the company, which was seconded by Mr. HANIS, and carried.—Mr. WALTON briefly replied.

This closed the proceedings, but before leaving the room a considerable portion of the new capital was subscribed.

DON PEDRO NORTH DEL REY (GOLD) MINING COMPANY.

The meeting of shareholders will be held at the Terminus Hotel on Wednesday, when the directors will present their annual report.

The gold return has amounted to 48,860 ozs., or 5633 ozs. troy, realising the sum of 21,317. 15s. 3d.; adding interest and other receipts the total income amounts to 22,682. 8s. 9½d., whilst the working expenses have been 24,793. 8s. 2d., leaving a loss of 2020. 19s. 5½d., the whole of which was incurred in the first half of the year. Great attention has been given to the question of reducing the expenses, and the directors believe that the establishment is now conducted in an economical manner, and are glad to be able to report that Capt. Vivian has completed some work, and has others in hand, as hereafter referred to, which will tend to economise labour, in addition to which he has effected a considerable saving in the important item of timber by obtaining poles and small trees from the company's woods. As regards the question of cost, it must be borne in mind that labour in Brazil is becoming dearer, whilst the expense of working has a natural tendency to increase as greater depth is attained.

The great pumping machinery, being unequal to the duty required of it, has entailed considerable expense, and repairs, in addition to which the cost of extracting ores have caused great loss of time, whilst it is manifest that the cost of extracting mineral from the bottom of the mine has been much increased for years past owing to the impossibility, with the existing pumping power and appliances, of systematically draining and opening out ground in advance of the stoping, so that operations in the bottom of the mine might be carried on in a regular and business like manner, instead of being followed at irregular intervals. If viewed, therefore, merely in relation to the cost, beneficial results may be expected from the completion of the permanent pumping machinery, and great relief will also be obtained from Symons' shaft, which it is intended to carry down on an incline under the shoots of gold, as the main exit of the mineral from the bottom of the mine.

OUTPUT AND PRODUCE.—The number of tons treated in 1876 was 14,405 62, with the following results:—

General work 43,477 ozs., from 14,405 62 tons.

Vein or boxwork 1,097 " " " 3 44 "

Mine sampling 803 " " " 3 44 "

Exceptional produce 2,884 " " = 48,860 ozs.

Capt. Vivian appears to be striving to make the mine self-supporting during the completion of the permanent works, and the directors consider that great credit is due to him for the energy and ability which he has already so successfully displayed. Nothing could have been more disheartening than the prospects when Capt. Vivian arrived at the mines; but during the year he has been able to report that the lodes have greatly improved in the bottom of the mine, and although the mineral therefrom has been limited in quantity owing to the stoping operations being impeded by water, the deposits found above water level have rendered such assistance that the result of the operations financially for the first year of Capt. Vivian's management (ending May 31) is that the produce has been sufficient within about 20000 to meet the cost, notwithstanding that included in that cost is the sum of 25240. 10s. 6½d. expended on the permanent pumping machinery. Several improvements have also been carried out, and others are in hand, that will tend materially to lessen the cost of working in the future. The produce telegraphed for the month of June—71000 tons—will probably show a profit of 6500.

IMPROVEMENTS IN WORKING.—Reference has been made to various labour-saving improvements introduced by Capt. Vivian, and amongst them may be mentioned the following:—A tramroad has been fixed in the drainage incline shaft below the 30 to enable the whim kilns, at present working to the bottom of the vertical or Vivian's shaft, to travel down the incline to the 55 fm. plat, thus avoiding the necessity of raising the mineral coming from the bottom of the mine by hand with to the horizon of the 30; this tramroad was put to work on April 30, and is answering well. Water power has been substituted for animals in the carriage of ore between the jiggers and wash house, whilst a road is being made from the entrance of the mine to the reduction works, whereby the whole output may be carried direct to that establishment instead of being tipped over a shoot just outside the mine, and taken on in other wagons. Such improvements as the foregoing tend to show that Capt. Vivian is alive to the necessity of introducing economy into the system of working.

[For remainder of Meetings see to-day's Journal.]

POLYGONOSCOPE.—A new optical instrument has been invented by Mr. EZRA HATTON, of Manchester, ornamental metal worker, for producing and displaying an infinite number of designs and patterns, which can be copied or photographed, and may be used for art manufacturers, for amusement, or for other purposes. The instrument consists of two mirrors of any desired shape or size, fixed in and protected by a case or frame of metal or any other suitable material; these mirrors are connected together by means of a universal hinge, which is so arranged that the mirrors can be set and fixed at any angle to produce any required design. One of the mirrors is loose in its frame, and can be moved towards or from the other, so that at whatever angle they may be fixed the edges of the mirrors can be made to touch each other, thus preventing the pattern or design from being broken in the centre. The apparatus can be closed up in a portable form, similar to an ordinary pocket book. Patterns having any number of angles or sides may be produced by varying the angles of the mirrors. The improved hinge for connecting the frames of the mirrors consists of three joints, that is to say, one joint for each frame, and a centre joint on which the other two hinge. By this means the frames can be opened to the full extent, and turned back to any angle, and they can be folded close together. This hinge is applicable to articles of furniture, and to other appliances.

the piston, the communication with the exhaust is closed, and the communication with the atmosphere is opened more or less both at top and bottom, whereby the piston will be allowed to descend in the tube by its own weight, and at a speed which is regulated by checking more or less the ingress and egress of air. By closing these altogether the motion of the piston may be arrested at any point. Other means, to be presently described, are provided for arresting the motion of the piston at any desired point, and also for moving it to a certain extent for the successive introduction and delivery of the trucks. In some cases two such pneumatic tubes are arranged side by side to be worked alternately, so that the air withdrawn from the one tube for raising its piston can be made to flow into the other for lowering the piston.

If cast-iron particularly acted upon, and if this cast metal heated to red heat is exposed in a retort to a current of carbonic acid alone or mixed with air it will be transformed into steel, and the gas will become carbonic oxide, which in passing into another retort charged with Bessemer metal at red heat will effect the conversion of this metal into fine steel, and will itself be reconverted into carbonic acid. Thus the carbonic acid (CO^2) raised to the casting its excess of carbon (C) is transformed into carbonic oxide (2CO), this passing over the iron of the Bessemer metal and the like, will give up the carbon (C), and will return to the state of carbonic acid (CO^2). From this a given volume of carbonic acid gas being given enclosed in a gasometer they may by passing this gas in the retorts heated to red heat and charged, the first with cast-iron, the second with Bessemer metal, the third with cast-iron, and the fourth with Bessemer metal, and thus in succession (provided that the series commencing with cast-iron terminates with one or two retorts charged with Bessemer metal) to transform the whole of the metal into steel, and on collecting the gas in a second gasometer the same operation may be recommenced, and so on indefinitely. If the passage of the gas takes place in a converter charged with melted cast-iron, the transformation of the casting is more regularly and easily done, and with less loss of iron.

The object of the invention of Mr. Z. BLANCHET, of Epinae, France, is to effect the raising and lowering of coal and minerals in mines by means of pneumatic tubes, instead of by the usual arrangement of hauling ropes or chains. For this purpose a vertical tube of large diameter is suspended in the shaft of the mine, the tube being closed at both ends, and having at the various levels or stages from which coal or other minerals require to be raised, one or more side doors sufficiently large to admit a truck with its load. Within the tube is a loose frame or cage having several stages on which the trucks are carried, and at each end of which is a piston fitting the tube. The upper end of the tube is connected by a pipe to an air-pump or other suitable suction apparatus, the pipe being provided with a valve, and it also has another pipe provided with a valve, by which the upper end of the tube may be made to communicate with the atmosphere. At the lower end of the tube is, firstly, a branch pipe closed by a valve opening outwards, and leading up to the top of the pit; and secondly, another branch pipe communicating with the bottom of the shaft, and having a valve opening inwards.

For raising the piston with its load in the tube, the communications between the tube and the air-pump is established, and the ingress pipe at the bottom is opened, whereupon the piston with its load will be moved upwards by the atmospheric pressure acting at bottom against the partial vacuum produced above. For lowering

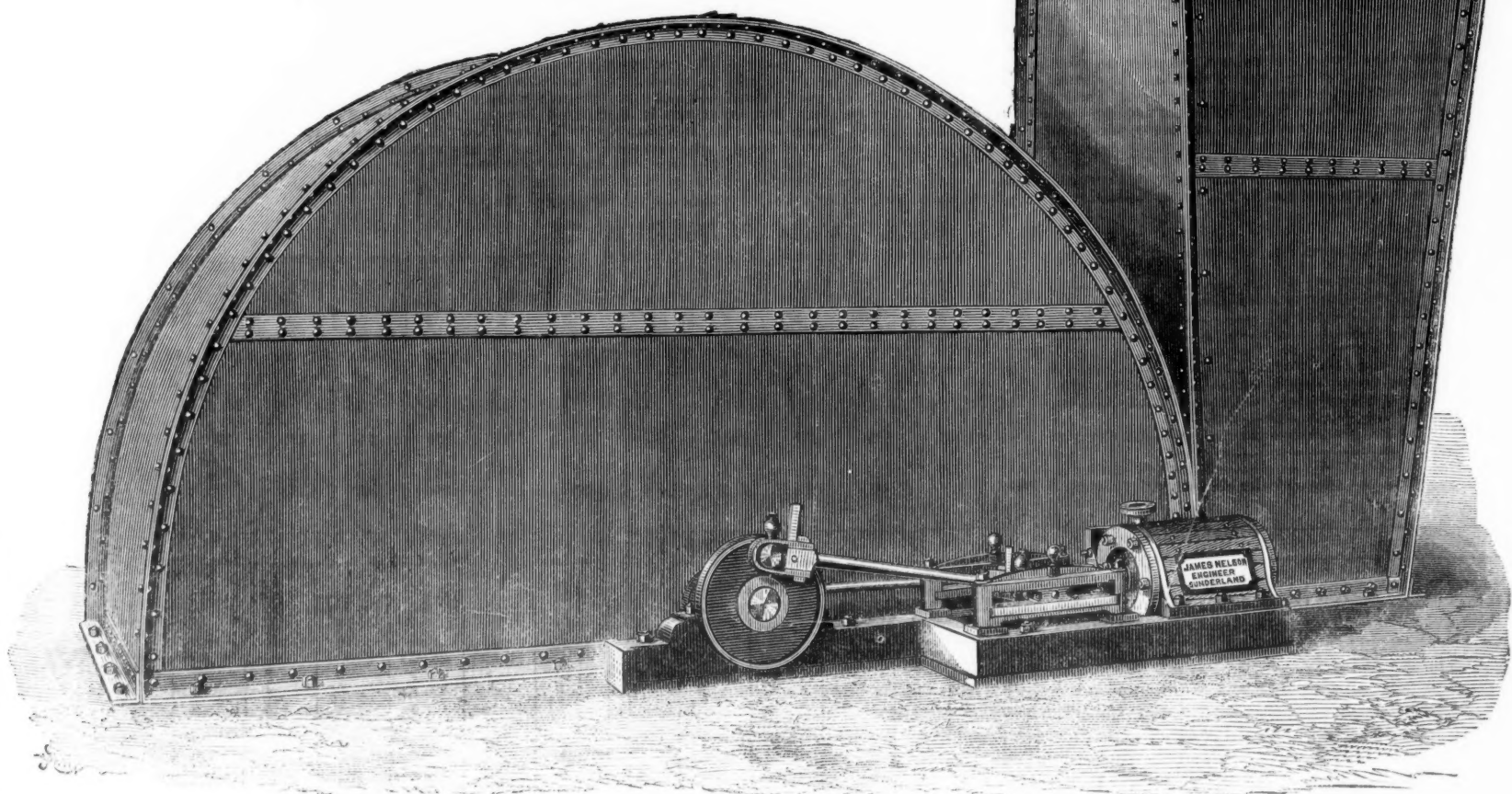
EXPANDING ROCK DRILL.—**MR. W. R. BURT**, of East Saginaw, Michigan, has patented an improved tool or drill for the purpose of enlarging the lower part of salt, oil, and artesian wells, without enlarging its top. It consists of hinged and wedge-shaped expanding arms that are spread or closed by a wedge-shaped slide piece and operating screw shaft passing through the same, and turning in the head of the socket of the expanding arms. By moving the wedge piece down the arms are spread outwardly, so as to pass against the surrounding walls of the well, and expand the same to some extent, obtaining thereby a larger sized hole than at the upper part of the well. By turning the screw shaft in opposite directions, the wedge piece is moved up, and the arms are brought closer to each other, to be drawn up again through the bore-hole.

LONGEST TUNNEL IN AMERICA.—Few people know how great an engineering enterprise is going on in Baltimore County. For one thing alone, a tunnel six and four-fifths miles long—3½, 10 feet—is being built underground, for over four fifths of the distance through hard gneiss and granite. It will be the longest tunnel in the country, and there will be only two larger in the world—the Mont Cenis, which is 8 miles in length, and the St. Gothard, now in progress of construction, and which is to be 9½ miles. The fact that the water supply tunnel lies near enough to the surface to allow of numerous shafts greatly facilitates its construction. The tunnel is a circle 12 ft. in diameter, and extends from the Gunpowder river, about 8 miles from the city, to Lake Montebello—the distributing reservoir—near the Hartford turnpike, about 1½ mile from the city, the direction being 26° west of south. This tunnel will conduct the water from the Gunpowder river to Lake Montebello. Thence a conduit, 4½ miles long, known as the Clifton Tunnel from the fact that it runs under a part of the Clifton road, conducts the water to a point just south of the Hartford road, where it enters six miles, each 4 ft. in diameter, which convey the water to the city, a distance of 1900 ft. The country along the line of the works is hilly, and the tunnel varies in depth below the surface from 67 to 353 ft. There are 15 shafts in the main tunnel, the deepest extending 294 ft. below the surface. The water rains down from the crevices of the rocks, and pours along the bottom of the drift. Gangs of men, each with his miner's lamp attached to his hat, are hard at work picking and delving in the flinty bowels of the earth; and the monotonous clang of the hammer upon the rock is constantly heard when the men are added to the firing line, when a safe way is made to a safe distance, and thunderous reports roll through the rocky corridors. The work of the tunneling is all done by hand, it being cheaper than the machine work in a drift of such narrow diameter. *Baltimore Gazette.*

HOLLOWAY'S PILLS FOR NERVOUS DEBILITY.—No part of the human machine requires more watching than the nervous system—upon it hangs health and life itself. These pills are the best regulators and strengtheners of the nerves, and the safest general purifiers. Nausea, headache, giddiness, numbness, and mental apathy yield to them. They dispatch in a summary manner those distressing dyspeptic symptoms, stomacheic pains, fulness at the pit of the stomach, abdominal distension, and overcome both capricious appetites and confined bowels—the common attending signs of a defective or deranged nervous power. Holloway's pills are particularly recommended to persons of studious and sedentary habits, who gradually sink into a nervous and debilitated state, unless some such restorative be occasionally taken.

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Engines of the most approved class for driving.
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PARIS INTERNATIONAL EXHIBITION, 1867.



VIENNA INTERNATIONAL EXHIBITION, 1873.



LONDON INTERNATIONAL EXHIBITION, 1874.



CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

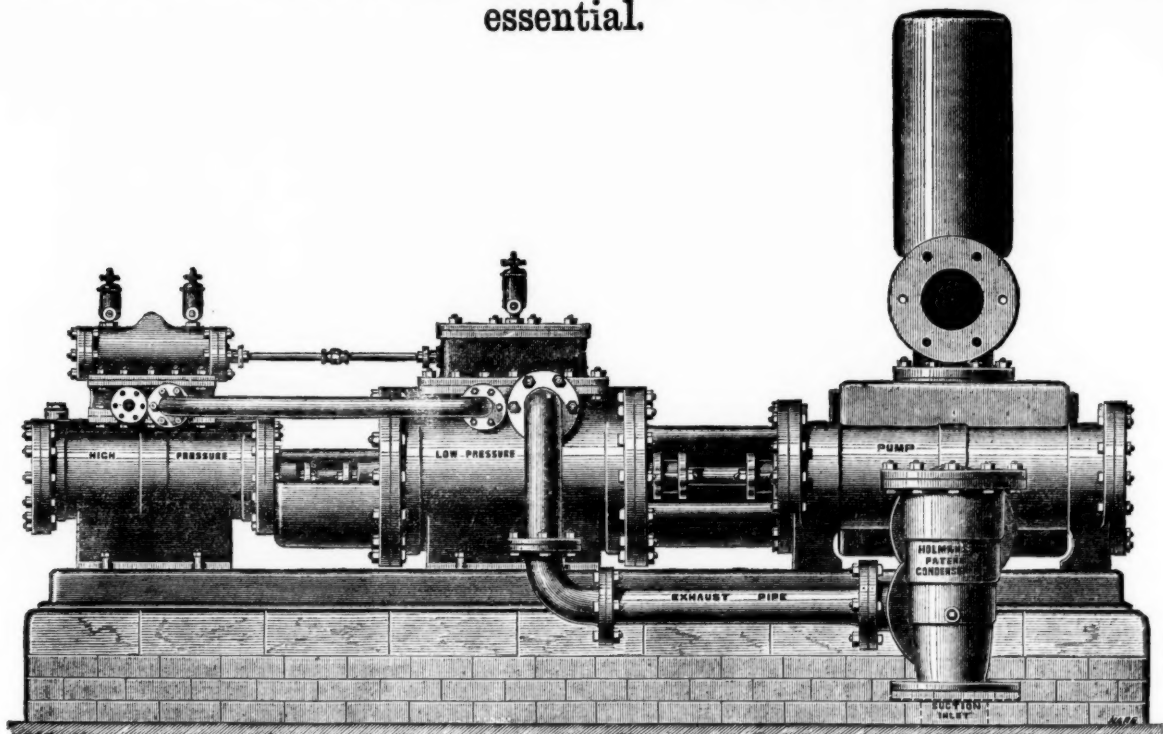
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THE SIMPLEST AND MOST CERTAIN IN ACTION.

The illustration shows an extension of the principle of this Pump to a Compound Steam Pumping Engine, by which the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere. The Engine combines simplicity, certainty of action, great compactness, fewness of parts, and consequent reduction in wear and tear.

Several thousands of the "Special" Steam Pumping Engines, with high-pressure cylinders only, are in use in British and Foreign Mines, Water Works, &c.,—and for confined situations, or where Engines of a comparatively small size only are necessary, they will still meet all requirements—but their application will be very largely increased, since it has been found practicable to embrace the important features of expanding and condensing the steam, so that increased power may be obtained, and the consumption of fuel greatly economised.

THE "SPECIAL" DIRECT-ACTING COMPOUND STEAM PUMPING ENGINE is the most simple appliance for deep mine draining and general purposes of pumping ever practically developed, and the first cost is very moderate compared with the method of raising water from great depths by a series of 40 to 50 fathom lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pit-work are required, while they allow a clear shaft for hauling purposes.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder.....In.	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder.....In.	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke.....In.	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate.....	3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Diameter Suction and Delivery.....In.	3	3½	4	3½	4	5	6	4	5	6	8	5	6	8	9
Diameter High-pressure Steam Inlet.....In.	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Diameter Low-pressure Steam Exhaust.....In.	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder.....	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto ditto—with Holman's Condenser.....	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto ditto—with Air-pump Condenser.....	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

Diameter of High-pressure Cylinder.....In.	16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder.....In.	28	28	28	28	32	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder.....In.	8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke.....In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate.....	15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,950	35,225	47,950
Diameter Suction and Delivery.....In.	6	8	9	10	6	8	9	10	8	9	10	8	9	10	9	10
Diameter High-pressure Steam Inlet.....In.	2½	2½	2½	2½	3	3	3	3	3½	3½	3½	4	4	4	5½	6½
Diameter Low-pressure Steam Exhaust.....In.	3	2	3	3	3½	3½	3½	3½	4	4	4	5	5	5	6½	6½
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder.....	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562	413
Ditto ditto ditto—with Holman's Condenser.....	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	550
Ditto ditto ditto—with Air-pump Condenser.....	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937	689

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

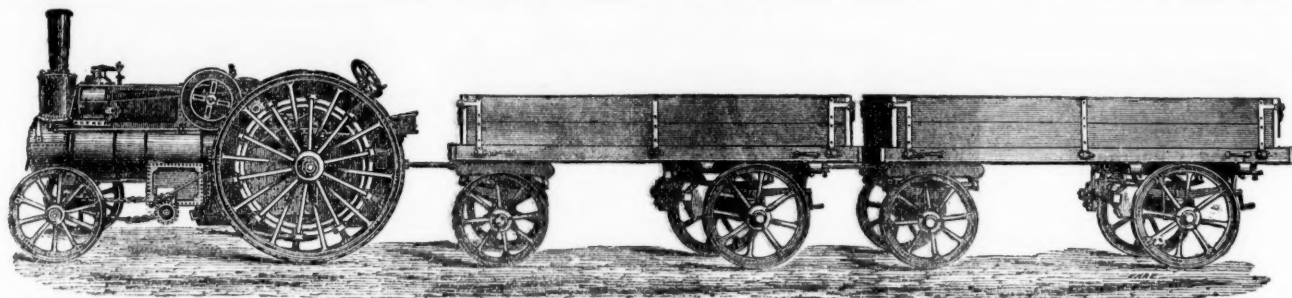
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PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862.

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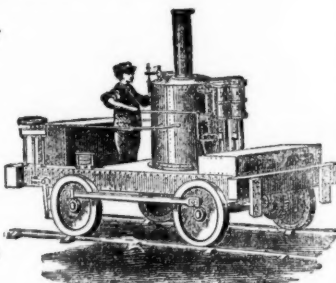
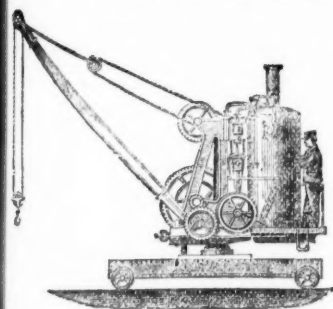
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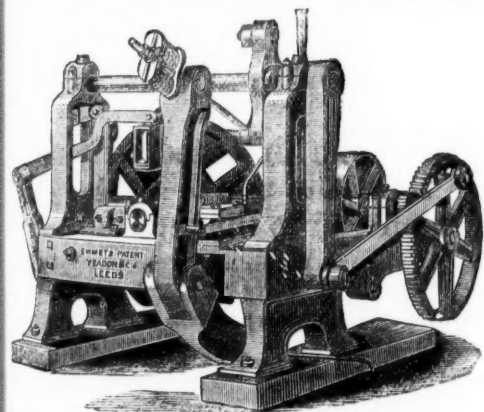
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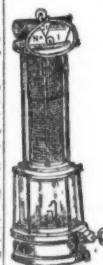
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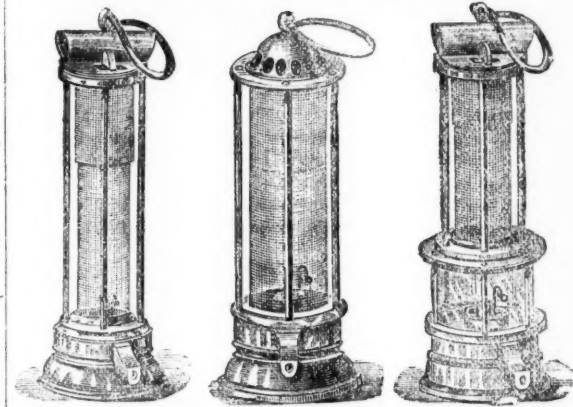
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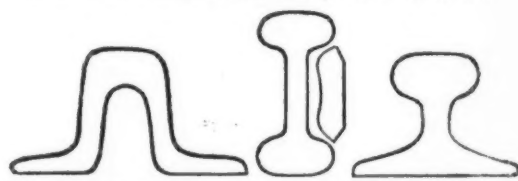
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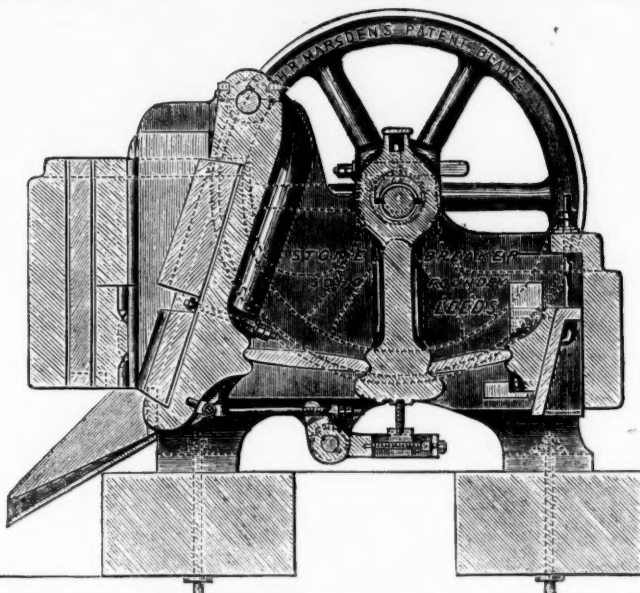
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